

**PRIVILEGED AND CONFIDENTIAL****PHASE I AND PHASE II  
ENVIRONMENTAL SITE ASSESSMENT, RICO, COLORADO**

March 14, 1995

Submitted to: John R. Jacus, Esquire  
c/o Davis, Graham, and Stubbs  
370 17th Street  
Denver, Colorado 80202  
Counsel for Rico Renaissance, L.L.C. formerly known as  
Rico Properties, L.L.C.

Submitted by:

Deb Anderson, REM  
Audit and Compliance Manager

David P. Buscher, Soil Scientist/Ecological Engineer

Reviewed by:

James P. Walsh, Principal in Charge

**WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, INC.**  
4888 Pearl East Circle, Suite 108  
Boulder, Colorado 80301

Walsh Project No. 1897-010  
Revised 5/12/95

*PRIVILEGED AND CONFIDENTIAL*

TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	iv
1.0 INTRODUCTION .....	1
2.0 SITE DESCRIPTION .....	2
2.1 Site Location and Description .....	2
2.2 Regional and Site Geology .....	2
2.3 Aerial Photograph Review .....	2
3.0 PUBLIC RECORDS REVIEW .....	4
3.1 Federal Records .....	4
3.1.1 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Sites .....	4
3.1.2 Resource Conservation and Recovery Act (RCRA) .....	6
3.1.3 Emergency Response Notification System (ERNS) .....	6
3.2 State Agency Records .....	7
3.2.1 Landfills/Solid Waste Activities .....	7
3.2.2 Leaking Underground Storage Tanks (USTs) .....	7
3.2.3 Registered Underground Storage Tanks (USTs) .....	8
3.2.4 National Pollutant Discharge Elimination System .....	8
3.3 Local Agency Records .....	9
3.3.1 Ownership Report .....	9
3.3.2 Rico Fire Department .....	9
3.3.3 Denver Public Library .....	9
4.0 VISUAL SITE INSPECTION .....	9
4.1 Subject Property .....	9
4.2 Map Units .....	11
4.2.1 Methods of Delineating Map Units .....	11
4.2.2 Map Unit Descriptions .....	11
4.3 Environmental Ranking System .....	11
4.4 Wetland Identification .....	12
4.5 Surrounding Properties .....	12
5.0 SOIL SAMPLES .....	12
5.1 Soil Sample Collection .....	13
5.2 Soil Analyses and Results .....	13

**PRIVILEGED AND CONFIDENTIAL**

**TABLE OF CONTENTS**  
Continued

6.0	WATER SAMPLES .....	14
6.1	Water Sample Collection .....	14
6.2	Water Analyses Results .....	14
7.0	ASSAY BUILDING .....	15
7.1	Site Assessment .....	15
7.2	Site Assessment Findings .....	16
8.0	FORMER HIGHWAY DEPARTMENT PROPERTY .....	17
8.1	Site Assessment .....	17
8.2	Site Assessment Findings .....	18
9.0	RICO TOWN DUMP .....	18
10.0	CONCLUSIONS .....	19
11.0	RECOMMENDATIONS .....	22
12.0	QUALIFICATIONS AND LIMITATIONS .....	23
	REFERENCES .....	24

**LIST OF APPENDICES**

APPENDIX A	AGENCY/PERSONAL CONTACT LIST
APPENDIX B	SITE PHOTOGRAPHS
APPENDIX C	MAP UNITS
APPENDIX D	RISK RANKINGS
APPENDIX E	FIGURES OF STUDY AREA
APPENDIX F	TABLES OF SAMPLE DESCRIPTIONS AND ANALYTICAL RESULTS
APPENDIX G	LABORATORY ANALYTICAL DATA
APPENDIX H	EPA INFORMATION ON RICO-ARGENTINE MINE AND NPL SITES IN COLORADO
APPENDIX I	QUALIFICATIONS OF CORPORATION AND PREPARERS OF PHASE I ENVIRONMENTAL SITE ASSESSMENT (ESA)
APPENDIX J	SITE INSPECTION PRIORITIZATION REPORT

*PRIVILEGED AND CONFIDENTIAL*

TABLE OF CONTENTS  
Continued

LIST OF FIGURES AND TABLES

FIGURE 1A	SITE MAP .....	3
TABLE 1	LIST OF AGENCY SOURCES .....	5

**PRIVILEGED AND CONFIDENTIAL**

**EXECUTIVE SUMMARY**

A Phase I Environmental Site Assessment (ESA) with limited water and soil sampling was conducted on approximately 3,000 acres in and near the town of Rico, Colorado in Dolores County, Colorado. Based on information obtained during the Phase I ESA, a Phase II ESA was conducted on selected properties within the study area. Rico is located in the southwest corner of the state in the San Juan Mountains. The properties assessed are located between latitudes 37° 43' 45" and 37° 40' and longitudes 108° 00' and 108° 3' 45".

The Phase II sampling was conducted to obtain information on the metals concentrations in soil at the various map units. Special emphasis was placed on characterizing map units such as waste rock piles, mine tailings, and fill material that may contain elevated concentrations of metals. Many of the parcels studied were made up of more than one map unit. Therefore, if a sample of waste rock was taken from a property that contained waste rock, fill, and native soil, the sample may not be indicative of the metals concentration on the entire property. This preferential or selective sampling may result in the reporting of values for some properties which are significantly higher than values that might be obtained for those properties if employing randomized or grid sampling. This approach was considered most appropriate to aid counsel and the client in evaluating the risks of potential environmental liability associated with the parcels included within the scope of this ESA.

A records review, interviews, aerial photograph interpretation, a visual site inspection, and soil sampling indicate that some properties within the study area have been impacted by past mining activities. Some properties within Rico have also been impacted by underground storage tanks (USTs) at or near the properties, mine waste used as fill material, hazardous substances on the property, and suspect asbestos in buildings.

The properties studied were ranked as high, medium, or low risk based on the map unit, site-specific sampling, and a subjective assessment of the risk relative to other properties within the study area. Map units with a high ranking include the following:

- alluvium mixed with mine waste material (AI/MW)
- alluvium mixed with mill tailings (AI/T)
- acid mine drainage (AMD)
- clinker/fill/alluvium (C/F/A)
- contaminated mine drainage (CMD)
- clinker with mine waste (C/MW)
- dump debris (DD)

***PRIVILEGED AND CONFIDENTIAL***

- disturbed soil (DS)
- fill material (F)
- fill material mixed with mine waste (F/MW)
- fill material mixed with mill tailings (F/T)
- leaking UST sites
- mine waste spoils (MW)
- mine waste and borrow areas (MW/BA)
- slag mixed with mine waste (S/MW)
- tailings impoundments (TP)
- wetlands mixed with tailings (WL/T)
- wastewater ponds (WWP)

These areas were ranked as high risk due to elevated metals concentrations in mine waste materials or due to other environmentally significant impacts (e.g., USTs). Rankings of areas mapped as native soil (map unit NS) and wetlands (WL) were dependent on soil analytical data, soil type, and proximity to high risk areas.

The key findings of the investigation are listed below.

- There are numerous mine sites within the study area where waste rock and tailings are evident. There is visible contamination downgradient of some of these sites where stormwater has transported mine wastes off site. Seepage from the mill site on Silver Creek is also visibly impacting the creek. The Colorado Department of Public Health and Environment (CDPHE) has not issued stormwater discharge permits for any of these mine sites.
- The analytical data from limited selective sampling indicate that concentrations of lead up to 12,000 milligrams per kilogram (mg/Kg) are present at some properties within the study area where fill material, mine tailings, waste rock, and slag are visible. Samples from these areas were selected to characterize the mapping units which were suspected to have elevated metals concentrations. Samples taken from properties that appeared to have native soil contained lead concentrations ranging from 62 mg/Kg to 9,300 mg/Kg with a mean value of 858 mg/Kg. Soil samples from some properties, especially in the southeast portion of the study area, did not contain elevated concentrations of lead. Samples in these areas contained lead concentrations of 62 mg/Kg to 260 mg/Kg which is well within background levels for lead in soil. Properties ranked as low risk have soil lead concentrations of less than 400 mg/Kg.

*PRIVILEGED AND CONFIDENTIAL*

- The Rico-Argentine site (as described in the U.S. Environmental Protection Agency's (EPA) Site Investigation Prioritization (SIP), Rico-Argentine, Rico, Colorado, dated October 11, 1994 (URS, 1994) which is included as Appendix J) is currently under study by the EPA. The Rico-Argentine Mine was identified in 1984 as being a potential environmental problem, and a site inspection was conducted at that time. EPA is reportedly planning on conducting an Expanded Site Inspection (ESI) of the Rico area (as defined by the EPA in the SIP) that will include sampling of residential soils, drinking water wells, surface water and sediment in Silver Creek and the Dolores River, and sampling of potential source materials. This ESI will be conducted as part of the Comprehensive Environmental Response, Compensation, and Liability Act process of determining if the Rico-Argentine site (CERCLIS ID No. 980952519) should be included as a Superfund site on the National Priority List (NPL). Following completion of the ESI, the site will be scored using the Hazard Ranking System. Sites scoring above 28.5 using this system are placed on the NPL. Additional studies (Remedial Investigation and Feasibility Study) are then conducted prior to cleanup of such sites. The current expanded study was triggered because of high mercury concentrations in downstream reservoirs on the Dolores River.
- A waste pond located in a tailings area on the south side of Rico appears to intermittently overflow and mine tailings are discharged to the Dolores River during overflow periods. Visible contamination is evident in the drainages downgradient of this pond.
- Fill material on Lots 36 to 40, Block 1 was composite sampled and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) methodology for metals. The sample extract contained 21 milligrams per liter (mg/L) lead and the regulatory level for characteristic hazardous wastes is 5 mg/L. Four composite samples for total lead were taken on these lots. The sample from Lots 36 to 38 (fill, waste rock, and tailings) contained 1,500 mg/Kg lead; the sample from Lots 39 and 40 (fill, waste rock, and tailings) contained 7,700 mg/Kg lead; and two samples taken from Lot 40 (native soil with some fill) contained 830 mg/Kg and 230 mg/Kg lead.
- Soil samples taken from near the septic tanks and leach line at the Assay Building contained concentrations of metals generally higher than those from a background sample taken near the Assay Building, but within the range of concentrations found in other samples taken in the Rico area. The soil excavated from around the septic system was analyzed using the TCLP methodology and this sample was found to contain metals concentrations below the regulatory levels used to determine if a material is a hazardous waste.

***PRIVILEGED AND CONFIDENTIAL***

- The analytical data from the former highway department facility show that petroleum hydrocarbon contamination is present in a limited portion of the soil at the property. The total volatile hydrocarbon (TVH) and total extractable hydrocarbon (TEH) concentrations in the soil near the tank piping exceed the CDPHE Remedial Action Category III regulatory levels (500 mg/Kg TVH/TEH). The TEH and TVH concentrations at the base of the tank excavation were well below the regulatory levels. The TCLP metals concentrations were also below the regulatory levels.
- There is one 55-gallon drum of unknown materials stored at the former highway department property.
- Lot 1, Block 1 is a reported leaking UST site. The CDPHE file for this facility indicated that soil contamination (288 mg/Kg total petroleum hydrocarbons) was detected at the time two USTs were removed from the site. The extent of impacted soil and potentially impacted ground water has not been determined.
- Several suspect asbestos-containing materials were identified in the buildings included in this study.
- Several chemical containers were found in the Assay Building including methyl isobutyl ketone; 1,1,1-trichloroethane; acetone; and potassium ferrocyanide.
- A 55-gallon unlabeled drum that reportedly contains kerosene is stored in the Burley Building.

*PRIVILEGED AND CONFIDENTIAL*

**PHASE I AND PHASE II ENVIRONMENTAL SITE ASSESSMENT  
RICO, COLORADO**

**1.0 INTRODUCTION**

This report presents the findings of a Phase I Environmental Site Assessment (ESA) conducted on approximately 3,000 acres of land in and near Rico, Colorado and Phase II ESA sampling conducted on selected properties within the study area. This assessment was conducted by Walsh Environmental Scientists and Engineers, Inc. (WALSH) at the request of Rico Renaissance, L.L.C., formerly known as Rico Properties, L.L.C., and its legal counsel. The objective of this assessment is to provide information regarding the environmental condition of the subject properties prior to possible acquisitions, so as to assist legal counsel in advising Rico Renaissance, L.L.C. The information developed regarding environmental conditions is intended to aid Rico Renaissance, L.L.C. in its evaluation of properties for possible acquisition.

The Phase I ESA consisted of a review of available city, county, state, and federal documents; examination of historical and recent aerial photographs; interviews with local residents and agencies; a visual inspection of the properties of interest; and limited soil and surface water sampling. The mining claims and properties within the town were mapped based on soil type. The properties studied were then ranked as high, medium, or low risk relative to other properties within the study area. The ranking was based on the map unit and site-specific sampling. Using the information from the Phase I ESA, Phase II studies were conducted at several of the properties in the study area because of site-specific environmental concerns. Listings of the contacts made for conducting this ESA are included in Table 1 and Appendix A.

The Phase II sampling was conducted to obtain information on the metals concentrations in soil at the various map units. Special emphasis was placed on characterizing map units such as waste rock piles, mine tailings, and fill material that may contain elevated concentrations of metals. Many of the parcels studied were made up of more than one map unit. Therefore, if a sample of waste rock was taken from a property that contained waste rock, fill, and native soil, the sample may not be indicative of the metals concentration on the entire property. This preferential or selective sampling may result in the reporting of values for some properties which are significantly higher than values that might be obtained for those properties if employing randomized or grid sampling. This approach was considered most appropriate to aid counsel and the client in evaluating the risks of potential environmental liability associated with the parcels included within the scope of this ESA.

***PRIVILEGED AND CONFIDENTIAL***

The procedures used in conducting this Phase I ESA meet or exceed the American Society of Testing and Materials (ASTM) Standard E-1527-93 for performing Phase I ESAs as adopted on March 15, 1993 (ASTM, 1993), with one exception. Section 11.5 of ASTM E-1527-93 requires that the report of the Phase I ESA shall include "the environmental professional's opinion of the impact of recognized environmental conditions in connection with the property." At the client's request, WALSH has not included such opinions in this report.

## **2.0 SITE DESCRIPTION**

### **2.1 Site Location and Description**

The study area is located in southwest Colorado in the San Juan mountains and includes developed and undeveloped properties in the town of Rico and numerous mining claims outside the town limits. The general area studied is shown on Figure 1A. The site is located between latitudes 37° 43' 45" and 37° 40' and longitudes 108° 00' and 108° 3' 45".

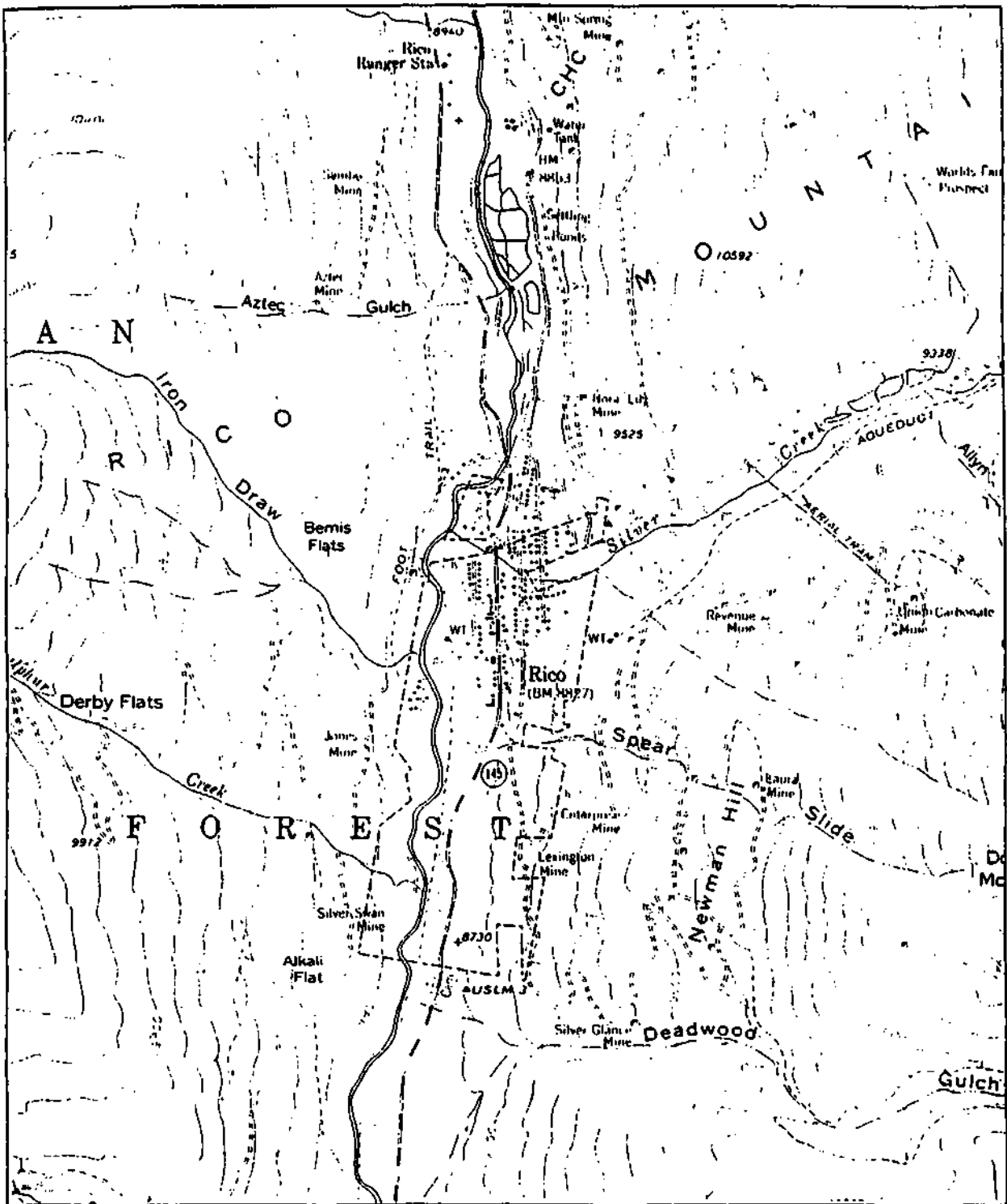
According to the Dolores County Assessor's office, the properties studied are owned by Rico Development Corporation. The prior owner of the properties was Anaconda Minerals Company. The properties are mostly bordered by national forest lands except for properties within the town limits.

### **2.2 Regional and Site Geology**

The study area lies within the Rico Mining District which is near the east end of Dolores County, Colorado in the San Juan Mountains. The majority of town sits on fan deposits and mineralized sedimentary and igneous rocks. The area east of town is made up of talus and slope wash, and the northeast portion is composed of sulfide-rich sedimentary and igneous rocks. The west portion of the study area is composed of talus and slope wash, and sedimentary and igneous rocks. Surficial material south of town is predominantly of talus and slope wash, torrential fans, and landslide deposits. Alluvium occurs along the floodplains of the Dolores River (U.S. Geological Survey, 1975).

### **2.3 Aerial Photograph Review**

Available historical aerial photographs from 1976 and 1992 were reviewed. The 1992 photographs were available in stereographic pairs allowing three-dimensional viewing of the area. The 1976 photograph was in color.



Map Scale: 1" = 2000'

Map Source: USGS Rico Quadrangle  
Colorado 7.5 minute Series (Topographic)  
1960 Photoinspired 1975.



**Walsh**

Environmental Scientists and Engineers, Inc.

Vicinity Map

Job 1897-010

Date 8/94

Figure 1A

***PRIVILEGED AND CONFIDENTIAL***

The 1976 photograph shows numerous mining sites where waste rock spoils and mine tailings were visible. The photograph also shows the Rico-Argentine Mine's water treatment ponds located north of Rico. These ponds discharge to the Dolores River. A sulfuric acid manufacturing plant is located just north of these ponds and a large area of dead trees is visible just east of the plant. There are several above-ground storage tanks (AGSTs) associated with this plant. Another set of ponds associated with the Rico-Argentine Mine are visible along Silver Creek, east of Rico.

The 1992 photographs show the area much as it appears today. Tailings impoundments, numerous mine waste spoils, and wastewater ponds at the Rico-Argentine Mine sites on the Dolores River and Silver Creek are still evident; however, the sulfuric acid plant is gone. The tree-kill area is still visible although new tree growth is evident in this area.

### **3.0 PUBLIC RECORDS REVIEW**

An environmental records search of several pertinent agency records was conducted. The search focused on properties within an area 1.5 miles north, 1.5 miles south, 1 mile east, and 1 mile west of the center of Rico. Table 1 lists the records searched.

#### **3.1 Federal Records**

##### ***3.1.1 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Sites***

CERCLA provides a system for prioritizing existing areas of known contamination for remediation. The U.S. Environmental Protection Agency (EPA) ranks the CERCLA Information System (CERCLIS) sites according to risk based on the Hazard Ranking System score. Higher risk sites are placed on the National Priority List (NPL) and these sites are then considered Superfund sites.

There is one listed CERCLIS site within the study area: the Rico-Argentine Mine located 1 mile north of Rico. The EPA file for this facility was reviewed and there were several reports on file pertaining to studies conducted at the mine. Various studies were completed throughout 1984 and 1985. Elevated concentrations of metals in water (beryllium, iron, manganese, and zinc) and sediment (arsenic, cadmium, copper, iron, lead, manganese, and zinc) were detected in the samples taken; however, drinking water standards were not exceeded in any of the samples. In 1985, EPA determined that no further action was required at the site.

**PRIVILEGED AND CONFIDENTIAL****TABLE 1 LIST OF AGENCY SOURCES**

Source Category	Specific Source	Search Distance	Updated by Source	Obtained from Source
National Priority List	CERCLIS Site Event List	1 mile	5/13/94	5/16/94
CERCLIS	CERCLIS Site Event List	1 mile	5/13/94	5/16/94
State Superfund	CDPHE list of private cleanup sites	1 mile	undated	4/1/93
RCRIS Generators	Facility List	adjacent sites	5/16/94	5/16/94
RCRA Corrective Action	Corrective Action List	1 mile	5/24/94	5/24/94
RCRA TSDs	TSD Notifiers List	1 mile	5/16/94	5/16/94
Underground Storage Tank (USTs) Leaks	Old List - (leaks listed through 9/30/90)	1/2 mile	10/90	11/27/90
	Old List (10/90 to 12/31/92)	1/2 mile	2/94	2/23/94
	Updated List (1994)	1/2 mile	2/94	2/23/94
	Trust Fund List	1/2 mile	12/93	12/28/93
Registered USTs	State UST List	adjacent sites	10/8/93	10/8/93
Landfills	CDPHE Current Landfills Data-base	1/2 mile	12/93	12/27/93
	CDPHE Historic Database	1/2 mile	9/90	1/14/93
ERNS Spills	Federal ERNS List	site only	5/15/94	5/15/94

RCRIS = Resource Conservation and Recovery Act (RCRA) Inventory System

ERNS = Emergency Response Notification System

TSD = Treatment, storage, and disposal

CERCLIS = Comprehensive Environmental Response, Compensation, and Liability Information System

CDPHE = Colorado Department of Public Health and Environment

***PRIVILEGED AND CONFIDENTIAL***

In January 1994, the no-further-action designation was removed from the site when elevated mercury concentrations were found in fish in the reservoirs near Dolores, Colorado. During the assessment of possible sources for this mercury contamination, the Rico-Argentine Mine site was listed as a potential source of metals contaminants in the Dolores River. An EPA contractor has reviewed the available data on the site and prepared a report for EPA regarding recommendations for further study in the area. If additional sampling is conducted, it will probably be started in fiscal year 1995.

There are no NPL sites within the study area.

***3.1.2 Resource Conservation and Recovery Act (RCRA)***

The RCRA Hazardous Waste Notifiers List is an inventory of registered transporters; burner/blenders; and large, small, and very small quantity generators of hazardous wastes. Large quantity generators generate more than 1,000 kilograms (2,205 pounds) of hazardous waste per month. Small quantity generators generate 100 kilograms (220 pounds) to 1,000 kilograms per month, and very small quantity generators (VSQGs) generate less than 100 kilograms of hazardous waste per month.

The RCRA Hazardous Waste Notifiers List was searched for the subject property and adjacent sites. There was one transporter listed: the Anaconda Minerals Company located 1 mile upstream from Rico, and one VSQG, the Colorado Department of Transportation (CDOT) on State Highway 145. The Anaconda Company site is the same facility discussed in Section 3.1.1 above.

The Treatment, Storage, and Disposal Facilities List was reviewed and there are no listed facilities within 1 mile of the subject property.

***3.1.3 Emergency Response Notification System (ERNS)***

Spill reports received by the EPA regarding hazardous substance incidents are maintained in an on-line database called ERNS. When a reportable quantity of a hazardous substance is released, the National Response Center must be notified within 24 hours and these reports are also included in ERNS. There has been one hazardous substance spill reported in the study area. This incident occurred at the Rico-Argentine Mine area north of Rico. EPA investigated the discharge of mine wastewater without treatment from the Rico Development/Anaconda Acid/Blaine Mine area in April 1990. The affected waterways were the Dolores River and Silver Creek.

***PRIVILEGED AND CONFIDENTIAL***

**3.2 State Agency Records**

***3.2.1 Landfills/Solid Waste Activities***

Records from the CDPHE were reviewed for landfills within the study area. CDPHE maintains a database of known open and closed landfills in the state. Three landfills with approximate locations and three landfills with unknown locations were identified from this source. Following is a listing of the landfill information:

<u>Name</u>	<u>Location</u>	<u>Waste Type</u>
Rico SWDS	1 mile east of Rico, S36,T40N,R11W	municipal waste
Anaconda Minerals Argentine	S24,T40N,R11W - ponds	unknown
Union Carbide (sic)	Dolores County near Rico	mill waste, tailings, radioactive
Ramco Acid Plant	S13,T40N,R11W	mill waste, tailings, into Dolores River
Mineral M&M Inc.	S26,T40N,R11W	mill waste, tailings, into Dolores River
Rico Mill	S13,T40N,R11W near Rico	mill waste, refuse, radioactive

Based on the section locations given for these landfills, it is likely that all of these landfills are located within the study area.

***3.2.2 Leaking Underground Storage Tanks (USTs)***

Several lists compiled by the CDPHE were searched for leaking USTs in the vicinity of the site. The lists identify locations where releases have been reported; where closures were conducted; where spills, overfills, or upgrades have occurred; and where contamination or tank leaks have been reported. Sites are not removed from the lists even if remediation has occurred and the site is no longer considered contaminated.

There was one reported leaking UST located within the study area, the Keith Duncan site on Lot 1, Block 1 in Rico. A review of the file for this site was conducted at the CDPHE. The file contained a notification that two USTs were being removed from the site in August 1989. They were a 1,000-gallon unleaded gasoline tank and a 2,000-gallon regular gasoline tank. The file also contained a letter from the San Juan Basin Health Department addressed to CDPHE reporting that the two tanks had been removed, the excavation had appeared clean, and a composite soil sample was taken from the excavation. The sample contained 288 milligrams per kilogram (mg/Kg) total petroleum hydrocarbons (TPH) and 2.5 mg/Kg

***PRIVILEGED AND CONFIDENTIAL***

Extraction Procedure Toxicity lead. The San Juan Basin Health Department recommended that no further investigations of the site should be performed.

***3.2.3 Registered Underground Storage Tanks (USTs)***

There are two facilities with registered USTs located within the study area and one with an unknown location. Information on registered tanks was obtained from the Colorado Department of Labor, Oil Inspection Section, UST inventory for the state of Colorado. The sites are listed below:

<u>Facility</u>	<u>Address</u>	<u>Tank Status</u>
Rico Town Shop	Campbell Street	2 tanks in use
CDOT - Rico	211 N. Highway 145	2 tanks in use
US West - Whitewater	RR 250663, Rico	1 tank in use

There is a convenience store located on the south end of Rico that sells gasoline. No AGSTs were visible at this facility; therefore, it is assumed that the facility has unregistered USTs.

***3.2.4 National Pollutant Discharge Elimination System***

Rico Development Corporation holds a permit for the discharge of treated wastewater from the Rico-Argentine Mine (CO-0029793). The CDPHE permit file was reviewed and several violation notices issued to Rico Development Corporation were contained in the file. There are two outstanding Notices of Violation and Cease and Desist Orders for the facility. One was issued in June 1993 and the other in January 1994. Several letters of violation have been issued to Rico Development Corporation for permit limitation violations and for submitting late reports to CDPHE. The site is also listed on EPA's Quarterly Non-Compliance Report for permit effluent violations and reporting violations.

The discharge from the St. Louis Tunnel failed the whole effluent toxicity test in September 1993 and April 1994. This test is used to determine toxicity to the biota by exposing fathead minnows and Ceriodaphnia dubia (water flea) to various dilutions of the discharged wastewater. The mortality rate for these organisms exceeded the permit limitations.

CDPHE regulations appear to require that stormwater discharge from inactive mines be permitted. CDPHE notified Rico Development Corporation that a stormwater permit was required and their attorney responded that the stormwater regulations did not apply to this

***PRIVILEGED AND CONFIDENTIAL***

facility because it is inactive. At the time of the file review, CDPHE had not taken any enforcement action against Rico Development Corporation regarding the lack of permitting for stormwater discharges.

**3.3 Local Agency Records**

***3.3.1 Ownership Report***

According to the Dolores County Assessor's office, the properties included in this study are owned by the Rico Development Corporation. The previous owner of the property is listed as the Anaconda Mining Company.

***3.3.2 Rico Fire Department***

A representative of the Rico Fire Department was contacted to determine if any hazardous materials incidents, spills, or fires had occurred on or near the subject properties within the town of Rico. There were reportedly no fires or incidents at the subject properties in town.

***3.3.3 Denver Public Library***

Sanborn Fire Insurance maps for the town of Rico were reviewed at the Denver Public Library. The 1899 Sanborn Fire Insurance map showed the main downtown area which was bounded by Mantz Avenue to the north, Campbell Street to the south, Garfield to the east, and Silver to the west. Several insets were included on the Sanborn Fire Insurance map showing the Grand View Mining and Smelting Company, Enterprise Mining Company, Colorado Milling and Concentrating Company, and the Rico and Aspen Consolidated Mining Company. There were no specific location references for these sites; however, there were notations that they were located 0.75 mile to 1.5 miles south of the post office. The post office was located on Glasgow Avenue in the approximate center of town.

**4.0 VISUAL SITE INSPECTION**

**4.1 Subject Property**

The study area was inspected by WALSH personnel on June 13 through 16, 1994. This inspection included a visual assessment of the study area and taking a limited number of soil and water samples from various properties. Photographs of the property are included in Appendix B.

***PRIVILEGED AND CONFIDENTIAL***

The study area was identified using maps provided by the client that showed properties of interest within the town of Rico and mining claims within and near Rico. Significant mine sites were identified using aerial photography prior to inspection. Areas that appeared to be native soil and forest were inspected by visually observing the area from existing roads. Some areas were not accessible and were only observed from a distance, such as from a side slope across a drainage. The study area and mapping units are shown on the figures included in Appendix E.

Four developed properties in Rico were inspected: the Burley Building, the theater/cafe, the Assay Building, and the former CDOT facility. Two small houses were included in the study area; however, access to these buildings was not obtained.

The Burley Building is a former office building located on Glasgow Avenue that is mostly vacant except for a small office area occupied by Rico Properties. The Anaconda Mining Company previously occupied the building. There are suspect asbestos-containing materials (ACMs) in this building including wall board, ceiling materials, and floor tile. There is an unlabeled 55-gallon drum on the main level of the building that reportedly contains kerosene (personal communication, Webster, 1994). There are also paint containers, plastic cement, and numerous core samples stored in the building.

The theater/cafe building is located adjacent to the Burley Building to the north and is currently vacant. The interior of the building is in poor condition and several potential ACMs were identified including wall board, ceiling materials, and floor tile. There is a boiler in the basement of the building that has suspect asbestos-containing insulation. There was an empty 55-gallon drum stored in the basement.

The Assay Building is located on the east side of Glasgow Avenue, north of the Burley and theater buildings. The Assay Building was a laboratory used to determine the mineral content of ores. There were several chemical containers (most of them empty), remaining in the building including methyl isobutyl ketone; potassium ferrocyanide; hydrogen peroxide; acetone; 1,1,1-trichloroethane; ammonium hydroxide; and a container (approximately 15-gallons) that contains a small amount of liquid that is reportedly acid (personal communication, Foster, 1994). There was an area of heavy oil staining in the northeast corner of the building on what appeared to have been an equipment pad. Rico does not have a municipal wastewater treatment system and therefore each building has an individual septic system. Wastewater generated at the Assay Building was discharged to an individual septic system.

The former CDOT property is located on Glasgow Avenue across the street from the Assay Building. There are two buildings and a shed on the property. The site was used by CDOT

***PRIVILEGED AND CONFIDENTIAL***

to fuel and repair vehicles. There were five 55-gallon drums stored on the property. One drum was partially full and was labeled "Delvac 1330," two drums were used for trash, and the remaining two drums were empty. Soil staining was evident on the west side of the northernmost building and there was a disturbed area near this building where it appeared that USTs had been located. There was wall board in the northernmost building that may be transite, an ACM. There was a large oil stain inside the southernmost building where a small drill rig and pump were stored. The USTs from this site were removed when Anaconda Minerals Company acquired the property. CDPHE did not have any reports on file for this facility and it is unknown whether any soil samples were taken when the tanks were removed.

The town of Rico uses surface water from Silver Creek as their drinking water source. The water intake is upgradient of the Rico-Argentine Mine site. At the time of the inspection, the CDPHE was recommending that drinking water be boiled because of inadequate disinfection of the water.

## **4.2 Map Units**

### ***4.2.1 Methods of Delineating Map Units***

Map units were identified and delineated using aerial photography, by visual inspection, and by digging shallow observation pits (6 to 25 inches deep). Areas containing similar materials were grouped together by map units. For example, areas containing native soil mixed with various amounts of mine waste were mapped as the same map unit.

### ***4.2.2 Map Unit Descriptions***

There were 23 map units identified and delineated in the study area. Table 2 in Appendix C describes the composition and locations of each map unit. The map units and properties of interest are shown on Figures 1 through 4 in Appendix E.

## **4.3 Environmental Ranking System**

The properties studied were ranked as high, medium, or low risk based on the map unit, site-specific sampling, and a subjective assessment of the risk relative to other properties within the study area.

A high-risk property was considered to be a property that had identified environmental concerns such as waste rock or tailings, USTs, visible contamination, or where sample analyses

***PRIVILEGED AND CONFIDENTIAL***

revealed contamination. A site was considered to be medium risk if the property was adjacent to, or downgradient from, a high-risk site and could be impacted by contamination from the high-risk site. A low-risk site was a site with native soils, no obvious contamination, and not in close proximity to a high-risk site. Areas located just upgradient from a high-risk site may also be rated as low risk. Low risk sites may have been impacted; however, this study did not identify any specific risk factors on these sites. If there were potential risks at the site such as fill material that had not been sampled and analyzed, the site is ranked as unknown risk. Due to the time constraints on completing the project, not all properties were sampled enough to sufficiently characterize the risks.

Table 3 in Appendix D lists each property, the risk ranking, and comments about the property. Figures showing the study area are included in Appendix E.

#### **4.4 Wetland Identification**

Soils in two areas surrounded by wetlands were excavated to 12 inches and observed to determine the presence of hydric soils as defined by the Federal Manual for Delineating Jurisdictional Wetlands (1987). One observation point was excavated at each of the two sites. Neither of the two sites exhibit hydric soils and are not jurisdictional wetlands.

Prior to any development in potential wetlands areas, the wetlands and non-wetlands will need to be delineated based on soils, vegetation, and hydrology. The development must then be approved by the Army Corp of Engineers.

#### **4.5 Surrounding Properties**

The majority of the study area is bordered by San Juan National Forest. Properties within the town of Rico are bordered by undeveloped lots and various buildings. Neighboring properties considered as high risk include Lot 1, Block 1 which is identified as a leaking UST site, and the Dolores County shop property which has registered USTs.

### **5.0 SOIL SAMPLES**

Surficial soil samples were taken from several properties within the study area. Samples from properties where the predominant material was native soil, mine waste, fill mixed with mine waste, alluvium, and slag mixed with mine waste were obtained.

***PRIVILEGED AND CONFIDENTIAL***

## **5.1 Soil Sample Collection**

Forty-eight soil samples were collected from the study area to evaluate metal concentrations in soils, fill, and mine waste materials in the study area. These samples were both single point grab samples (discrete samples) and composite samples. The composite samples consisted of sample aliquots from two to four areas within a claim or town parcel and were used to provide broader sampling coverage of the study area. The distance between aliquots was determined by the property size. Sample depths varied from 0 to 7 inches. Samples collected from depths greater than 7 inches were of various types of fill material. Samples collected from a depth of 0 to 7 inches were of native soil or some type of mine waste material. The composition, sample type, depth increment, and location of each soil sample collected are described in Table 4 in Appendix F. Soil sample locations are shown in Figures 1 through 4 in Appendix E.

All soil samples were collected using a decontaminated shovel. Sampling equipment was decontaminated with Alconox<sup>TM</sup> soap and distilled water after every sample was taken. The collected soil material was placed into ziplock plastic bags or glass sample containers, stored in a cooler containing ice, and then sent to the laboratory for analysis. The chain-of-custody records are included with the laboratory data in Appendix G.

The samples were analyzed for metals using an ICP Screen (EPA Method 6010) and a manual cold-vapor technique (EPA Method 7471). A few of the samples were also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) method of analysis. Table 5 in Appendix F shows the analytical results, and copies of the laboratory data are included in Appendix G.

## **5.2 Soil Analyses and Results**

Environmentally significant findings were discovered at several of the properties, especially where mine waste, tailings, and fill material were evident. Elevated concentrations of metals such as lead, cadmium, and zinc were detected on all the properties sampled where mine waste, fill, or tailings were visible. Some elevated concentrations of these metals were also detected on properties that appeared to be native soil. There were several properties where no elevated concentrations of metals were detected.

Sampling conducted on September 7, 1994 on the Smuggler, Yankee Boy, Hillside #2, Hillside, Home, Sam Patch, and Little Ada North claims; Group tract; Warner K. Patrick tract; and Blocks 1, 2, 10, 11, 38, and 39 was designed to identify potential high concentrations of metals. Areas with visual contamination were specifically selected for sampling during

**PRIVILEGED AND CONFIDENTIAL**

this sampling event and may not be indicative of metals concentrations on the entire property.

The lead concentrations were highly variable throughout the study area, and variances were also seen when multiple samples were taken from the same parcel. The shaded metals values listed in Table 5, Appendix F denote elevated concentrations. Concentrations were considered elevated at 400 mg/Kg or higher based on recently published EPA guidance documents (EPA, 1994a and 1994b) that recommend further evaluation of areas where the lead concentration in bare soil in residential areas exceeds 400 mg/Kg.

Several samples were taken at Lots 36 to 40, Block 1 where installation of a septic system is planned. The first composite sample was taken on Lots 39 and 40 at a depth of 0 to 4 inches. This sample contained 1,500 mg/Kg lead. The second sample was a composite taken from 0 to 8 feet in a trench excavated on Lots 36 to 38. This sample contained 7,700 mg/Kg total lead and 21 milligrams per liter (mg/L) TCLP lead. The next two samples were taken from a trench excavated on Lot 40. The trench was excavated from the approximate center of the lot to the west about 20 feet. One composite sample from 0 to 3 feet was taken from the east end of the trench and one from the west. These samples contained 830 mg/Kg and 230 mg/Kg lead, respectively.

## **6.0 WATER SAMPLES**

### **6.1 Water Sample Collection**

Water samples were obtained from the Dolores River, Silver Creek, and from a spring near the Mountain Springs mine. Three samples were taken from the river; one from upgradient of the study area near the ABG Mine, one directly downstream of the discharge from the Rico-Argentine Mine treatment ponds, and one at the downstream edge of the study area. The sample from Silver Creek was taken downstream of the discharge entering the creek from the Rico-Argentine Mill approximately 1 mile east of Rico. The samples were collected in plastic sample bottles and were preserved with nitric acid. The samples were analyzed for total metals using an ICP Screen (EPA Method 6010) and a manual cold-vapor technique (EPA Method 7471).

### **6.2 Water Analyses Results**

The highest metals concentration were found in the sample from the Mountain Springs mine. The pH of this water was very low (pH = 3.9). These acidic conditions contribute to the

**PRIVILEGED AND CONFIDENTIAL**

metals being in solution. The concentrations of iron, manganese, and zinc directly downgradient of the Rico-Argentine Mine discharge were elevated when compared to the other samples taken from the river; however, the water quality standards established for these parameters in the Dolores River were not exceeded. The detection limits for arsenic, cadmium, copper, lead, mercury, selenium, and silver were not low enough to determine if these water quality standards had been exceeded. The high detection limits were the result of running screening analyses for gross metals contamination rather than more precise drinking water analyses. Table 6 in Appendix F shows the analytical results and copies of the laboratory data are included in Appendix G.

## **7.0 ASSAY BUILDING**

### **7.1 Site Assessment**

On June 30, 1994, the septic tanks and leach line at the Assay Building were exposed using a backhoe to facilitate sampling of soils adjacent to the tanks and lines. The excavation was started on the north side of the building where the tanks were reportedly located. The area from the center of the building to the northeast corner of the building was excavated to a depth of about 4 feet without encountering the tanks. The area east of the building was then excavated and the tanks were located in this area about 5 feet below ground surface (bgs). There were two 200- to 300-gallon capacity fiberglass tanks in series. The bottom of the tanks were moist; however, there was insufficient liquid or sludge in the tanks to obtain a sample. The leach line ran from the northernmost tank to the northeast corner of the building and then ran west to near the northwest corner of the building. The leach line consisted of perforated 4-inch PVC pipe.

During the excavation process, field monitoring for hydrogen cyanide gas and volatile organic compounds (VOCs) was conducted. A photo-ionization detector (PID) was used to screen for VOCs. The detection limit of the PID is one part per million (ppm) isobutylene equivalency. The highest VOC reading was 15 ppm from near the septic tanks. Hydrogen cyanide was not detected at any time.

After the tanks and pipe were exposed, grab samples were obtained from near the leach line and septic tank directly downgradient of the tanks, and near the southwest corner of the property. The samples were taken from 5 to 8 feet bgs. The area at the west end of the leach line was excavated to a depth of 12 feet to determine if shallow ground water was present close to the leach line. Ground water was not encountered in this test pit. After the subsurface samples were taken, a composite sample of the excavated soil was taken to deter-

***PRIVILEGED AND CONFIDENTIAL***

mine if the soil would need to be classified as a hazardous waste. Following completion of the sampling activities, the trench and test pits were backfilled with the excavated material because of the safety hazard of leaving the trench open. Photographs of the excavated areas are included in Appendix B.

Samples from near the tanks and leach line were analyzed for VOCs, semi-volatile organic compounds (SVOCs), metals, cyanide, and sulfate. The composite sample of the excavated soil was analyzed using the TCLP method for VOCs, SVOCs, metals, pesticides, and herbicides. The sampling locations are shown on Figure 5 in Appendix E and are listed in Table 7 in Appendix F.

All soil samples were collected using a decontaminated shovel. Sampling equipment was decontaminated with Alconox™ soap and distilled water after each sample was taken. The collected soil was placed into the appropriate sample containers, stored in a cooler containing ice, and then sent to the laboratory for analysis.

## **7.2 Site Assessment Findings**

Soil samples were taken from a trench and test pits near the septic tanks and leach line for the Assay Building. The samples were analyzed for metals using an ICP Screen (EPA Method 6010) and a manual cold-vapor technique (EPA Method 7471), VOCs (EPA Method 8240), SVOCs (EPA Method 8270), and cyanide and sulfate (EPA Method SW-846). The analytical results are included in Table 8 in Appendix F and copies of the laboratory data are in Appendix G.

The analytical data show that the concentration of certain metals in the soil adjacent to the leach line are elevated when compared to on-site background concentrations (Sample SP-06). The concentrations of cadmium, lead, manganese, mercury, and silver in samples taken along the leach line are higher than the concentrations typically detected in the western U.S.; however, they are within the range of concentrations found in other samples taken in the Rico area. The composite sample analyzed using the TCLP analyses revealed that the metals concentrations were well below the regulatory levels for determining if a material is a hazardous waste. VOCs, SVOCs, and cyanide were not detected at concentrations exceeding the detection limit and the sulfate concentrations were within the normal range for soils.

*PRIVILEGED AND CONFIDENTIAL*

## 8.0 FORMER HIGHWAY DEPARTMENT PROPERTY

### 8.1 Site Assessment

On August 17, 1994, the area where USTs were located at the former highway department property was excavated and soil samples were taken to determine if petroleum hydrocarbon contamination was present in the soil. There were reportedly three USTs at the site; two 1,000-gallon diesel tanks and one 500-gallon gasoline tank. The tanks were removed in 1986 (personal communication, Todd Jones, CDOT, 1994).

The excavation was started on the south side of the main building by the walk-through door. The first trench was excavated in the approximate center of the tank installation area. The soils consisted of fill material with brick debris in the first 5 to 6 feet. At 6 to 7 feet the soil appeared to be natural clay and silty/clay soil with large cobbles and boulders. The excavation was then expanded to the east and west and similar fill material and soil was encountered. Tank piping was exposed near the building in the northeast corner of the excavation near the former location of the fuel pumps. A small area of visibly contaminated soil was evident and a hydrocarbon odor was detected in the soil in this area.

During the excavation process, field monitoring for VOCs was conducted using a PID. The detection limit of the PID is 1 ppm isobutylene equivalency. The highest VOC reading was 13 ppm in the headspace from a sample near the tank piping. The excavated soils were monitored and no hydrocarbon vapors were detected.

Three grab samples were obtained from the excavation, two from the interface of the fill material and the natural soils where the bottom of the tanks would have been located (about 7 feet bgs) and one sample from near the tank piping (2 to 3 feet bgs). After the samples were obtained, the excavation was backfilled with the removed material. Ground water was not encountered in the excavation. Photographs of the excavated areas are included in Appendix B.

Each of the three samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), TVH, TEH, and TCLP metals. The sampling locations are shown on Figure 6 in Appendix E.

All soil samples were collected using a decontaminated shovel. Sampling equipment was decontaminated with Alconox™ soap and distilled water after each sample was taken. The collected soil was placed into the appropriate sample containers, stored in a cooler containing ice, and then sent to the laboratory for analysis.

*PRIVILEGED AND CONFIDENTIAL*

## 8.2 Site Assessment Findings

Soil samples were taken from the area where three USTs were formerly located. The samples were analyzed for BTEX (EPA Method 8020), TVH/TEH (Modified EPA Method 8015), and TCLP metals (EPA Methods 3010, 6010, and 7470). The analytical results are included in Tables 9 and 10 in Appendix F and copies of the laboratory data are in Appendix G.

The analytical data show that petroleum hydrocarbon contamination is present in the soil at the property. The TVH and TEH concentrations in the soil near the tank piping exceeds the CDPHE Remedial Action Category III regulatory levels (500 mg/Kg TVH/TEH). This contamination is limited to a small area near the tank piping. The TEH and TVH concentrations at the base of the tank excavation were below the regulatory levels. The TCLP metals concentrations were also below the regulatory levels. Because the USTs were removed prior to December 22, 1988, assessment of the areal extent of contamination at the site is not required under CDPHE regulations unless specifically requested.

## 9.0 RICO TOWN DUMP

An assessment of the waste deposited at the former Rico dump site was conducted. Several trenches were excavated at the site using a backhoe. The trenches were excavated to determine the depth and type of waste disposed in the landfill, and to facilitate taking samples of the soils underlying the landfill. It appeared that trash was placed in long trenches and then covered with about 1.5 to 2 feet of fill. The trash extends to 13 feet deep in places. An access road is proposed for over the landfill, and the proposed road site is relatively free of thick trash deposits. The landfill dimensions are about 160 feet (north/south) by 140 feet (east/west).

A total of 11 trenches were excavated at the site. Six of the trenches did not contain waste materials. Four of the trenches contained little waste, and one trench in the southwest corner of the dump contained large amounts of waste. Two soil samples were taken at the site, one from a trench containing a small amount of trash on the west/central portion of the dump at a depth of 6 feet (just above bedrock). Debris in this trench consisted primarily of soil and cobbles but included glass, cans, plastic, black-stained soil, wood, and paper. The second sample was taken from the trench in the southwest corner of the site that contained pipes, wire, cans, a hot water heater, pails, pans, glass, plastic, rugs, lumber, rubber, and clothes. The sample was taken at a depth of about 14 feet, which was 2 feet below the disposed wastes.

***PRIVILEGED AND CONFIDENTIAL***

Each of the samples was analyzed for VOCs, SVOCs, and total metals. No detectable concentrations of the target compounds were found in the VOC and SVOC analyses. The metals results are included in Table 5 in Appendix F. Copies of the laboratory data are in Appendix G.

## 10.0 CONCLUSIONS

WALSH's conclusions for this Phase I and Phase II ESA are based on information provided by the client, available public records, discussions with selected personnel and government agencies, the general site conditions determined by a visual inspection, and data from site sampling. Environmental legislation passed in the 1970s and 1980s initiated the current practice of maintaining environmental records and facility inspection reports. Prior to the 1970s, activities may have adversely impacted the subject area without being documented by government agencies. There is also no guarantee that the current record-keeping requirements are adhered to by all facilities.

A records review, interviews, aerial photograph interpretation, visual site inspection, and generalized sampling indicates that several properties within the study area have been impacted by past mining activities. Other properties in Rico have been impacted by USTs at or near the properties, mine waste used as fill material, hazardous substances on properties, and suspect ACMs in buildings. Based on this limited evaluation, a number of properties do not appear to have been impacted.

The properties studied were ranked as high, medium, or low risk based on the map unit, site-specific sampling, and a subjective assessment of the risk relative to other properties within the study area. Map units with a high ranking include the following:

- alluvium mixed with mine waste material (AI/MW)
- alluvium mixed with mill tailings (AI/T)
- acid mine drainage (AMD)
- clinker/fill/alluvium (C/F/A)
- contaminated mine drainage (CMD)
- clinker with mine waste (C/MW)
- dump debris (DD)
- disturbed soil (DS)
- fill material (F)
- fill material mixed with mine waste (F/MW)
- fill material mixed with mill tailings (F/T)

***PRIVILEGED AND CONFIDENTIAL***

- Leaking UST sites
- mine waste spoils (MW)
- mine waste and borrow areas (MW/BA)
- slag mixed with mine waste (S/MW)
- tailings impoundments (TP)
- wetlands mixed with tailings (WL/T)
- wastewater ponds (WWP)

These areas were ranked as high risk due to elevated metals concentrations in mine waste materials or due to other environmentally significant impacts (e.g., USTs). Rankings of areas mapped as native soil (map unit NS) and wetlands (WL) were dependent on soil analytical data, soil type, and proximity to high risk areas.

The key findings of the investigation are listed below.

- There are numerous mine sites within the study area where waste rock and tailings are evident. There is visible contamination downgradient of some of these sites where stormwater has transported mine wastes off site. Seepage from the mill site on Silver Creek is also visibly impacting the creek. The CDPHE has not issued stormwater discharge permits for any of these mine sites.
- The analytical data from limited selective sampling indicate that concentrations of lead up to 12,000 mg/Kg are present at some properties within the study area where fill material, mine tailings, waste rock, and slag are visible. Samples from these areas were selected to characterize the mapping units which were suspected to have elevated metals concentrations. Samples taken from properties that appeared to have native soil contained lead concentrations ranging from 62 mg/Kg to 9,300 mg/Kg with a mean value of 858 mg/Kg. Soil samples from some properties, especially in the southeast portion of the study area, did not contain elevated concentrations of lead. Samples in these areas contained lead concentrations of 62 mg/Kg to 260 mg/Kg which is well within background levels for lead in soil. Properties ranked as low risk have soil lead concentrations of less than 400 mg/Kg.
- The Rico-Argentine site (as described in the EPA's SIP, Rico-Argentine, Rico, Colorado, dated October 11, 1994 (URS, 1994) which is included as Appendix J) is currently under study by the EPA. The Rico-Argentine Mine was identified in 1984 as being a potential environmental problem, and a site inspection was conducted at that time. EPA is reportedly planning on conducting an Expanded Site Inspection (ESI) of the Rico area (as defined by the EPA in the SIP) that will include sampling

***PRIVILEGED AND CONFIDENTIAL***

of residential soils, drinking water wells, surface water and sediment in Silver Creek and the Dolores River, and sampling of potential source materials. This ESI will be conducted as part of the CERCLA process of determining if the Rico-Argentine site (CERCLIS ID No. 980952519) should be included as a Superfund site on the NPL. Following completion of the ESI, the site will be scored using the Hazard Ranking System. Sites scoring above 28.5 using this system are placed on the NPL. Additional studies (Remedial Investigation and Feasibility Study) are then conducted prior to cleanup of such sites. The current expanded study was triggered because of high mercury concentrations in downstream reservoirs on the Dolores River.

- A waste pond located in a tailings area on the south side of Rico appears to intermittently overflow and mine tailings are discharged to the Dolores River during overflow periods. Visible contamination is evident in the drainages downgradient of this pond.
- Fill material on Lots 36 to 40, Block 1 was composite sampled and analyzed using the TCLP methodology for metals. The sample extract contained 21 mg/L lead and the regulatory level for characteristic hazardous wastes is 5 mg/L. Four composite samples for total lead were taken on these lots. The sample from Lots 36 to 38 (fill, waste rock, and tailings) contained 1,500 mg/Kg lead; the sample from Lots 39 and 40 (fill, waste rock, and tailings) contained 7,700 mg/Kg lead; and two samples taken from Lot 40 (native soil with some fill) contained 830 mg/Kg and 230 mg/Kg lead.
- Soil samples taken from near the septic tanks and leach line at the Assay Building contained concentrations of metals generally higher than those from a background sample taken near the Assay Building, but within the range of concentrations found in other samples taken in the Rico area. The soil excavated from around the septic system was analyzed using the TCLP methodology and this sample was found to contain metals concentrations below the regulatory levels used to determine if a material is a hazardous waste.
- The analytical data from the former highway department facility show that petroleum hydrocarbon contamination is present in a limited portion of the soil at the property. The TVH and TEH concentrations in the soil near the tank piping exceed the CDPHE Remedial Action Category III regulatory levels (500 mg/Kg TVH/TEH). The TEH and TVH concentrations at the base of the tank excavation were well below the regulatory levels. The TCLP metals concentrations were also below the regulatory levels.

***PRIVILEGED AND CONFIDENTIAL***

- There is one 55-gallon drum of unknown materials stored at the former highway department property.
- Lot 1, Block 1 is a reported leaking UST site. The CDPHE file for this facility indicated that soil contamination (288 mg/Kg total petroleum hydrocarbons) was detected at the time two USTs were removed from the site. The extent of impacted soil and potentially impacted ground water has not been determined.
- Several suspect ACMs were identified in the buildings included in this study.
- Several chemical containers were found in the Assay Building including methyl isobutyl ketone; 1,1,1-trichloroethane; acetone; and potassium ferrocyanide.
- A 55-gallon unlabeled drum that reportedly contains kerosene is stored in the Burley Building.

## **11.0 RECOMMENDATIONS**

Based on the findings of this Phase I and Phase II ESA, WALSH makes the following recommendations.

- Sites rated as high risk have significant potential for environmental liability. Sites ranked as medium risk may also have significant potential for environmental liability and may require more thorough evaluation prior to acquisition to more accurately determine the risk. Sites ranked as low risk, based on the level of inquiry used for preparing this report, do not appear to have high concentrations of metals in the soil. Additional site evaluation may be required based on the client's requirements.
- The fill material at Lots 36 to 40, Block 1 should be properly managed, especially if the site is used for installation of a septic tank and leach field system.
- All areas with visual contamination, mine tailings, slag, waste rock, and other visible contaminant migration have significant potential to create environmental liability for a prospective purchaser.
- Surveys should be conducted of some properties to determine if the identified risk factor is located on a property of interest.

***PRIVILEGED AND CONFIDENTIAL***

- A wetlands survey should be conducted prior to purchase of properties that may be wetlands (e.g., Max Boehmer tract, Rico Smelting Company tract).
- An asbestos survey should be conducted on the buildings studied prior to renovation or demolition of the buildings.
- The chemicals stored in the Assay Building, Burley Building, theater building, and the former CDOT buildings will need to be characterized and properly disposed if the current owner does not remove these chemicals prior to property transfer.

## **12.0 QUALIFICATIONS AND LIMITATIONS**

WALSH has performed a Phase I ESA of properties in and near Rico, Colorado in conformance with the scope and limitations of ASTM Practice E-1527, with one exception. Section 11.5 of ASTM E-1527-93 requires that the report of the Phase I ESA shall include "the environmental professional's opinion of the impact of recognized environmental conditions in connection with the property." At the client's request, WALSH has not included such opinions in this report. The qualifications of the personnel preparing this assessment are included in Appendix I.

This assessment was limited and it did not include:

- Collection, testing, or chemical analysis of any samples of ground water, wastewater, building materials, or other material which was or could have been observed on-site, except those specifically mentioned in this report;
- Interviews, except as specifically noted in this report, with past owners, tenants, employees, or neighboring landowners regarding past site use, waste generation and disposal practices (including disposal at remote sites), or manufacturing processes which may have contributed to environmental contamination at the property;
- Evaluation of the potential risks associated with identified concerns from records searches that could not be located in relation to the subject property, or sites where no records were available for review.

The sources of information obtained to perform this assessment include documents, oral statements, and other information from parties outside of WALSH's control. The accuracy of the information cannot be guaranteed by WALSH. If additional information concerning

***PRIVILEGED AND CONFIDENTIAL***

site environmental conditions becomes available, the conclusions presented in this report will not be considered valid unless this information is reviewed and the conclusions and recommendations of this report are modified and approved in writing by WALSH. The conclusions presented in this report are based on field observations, limited laboratory analyses, and WALSH's professional experience under similar conditions. Additional sampling and testing could alter the conclusions of this report. This report was prepared only for the use of our client, the client's agents, and their legal counsel. The scope of the project and findings of the report were limited based on conversations with the client and their counsel. WALSH is not responsible for use of the information in this report by third parties.

### 13.0 REFERENCES

American Society of Testing and Materials (ASTM). 1993. Standard Practice for ESAs: Phase I ESA Process. E1527-93.

Personal Communication with Stan Foster, Rico realtor and resident, 1994.

Personal Communication with Todd Jones, CDOT, 1994.

Personal Communication with Wayne Webster, property owner, 1994.

URS Consultants Inc. October 11, 1994. *Site Inspection Prioritization, Rico-Argetine, Rico, Colorado.*

U.S. Environmental Protection Agency (EPA), Office of Solid Waste and Emergency Response. 1994a. *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities.* OSWER Directive #9355.4-12

U.S. Environmental Protection Agency (EPA), Office of Prevention, Pesticides and Toxic Substances. 1994b. *Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead-Contaminated Soil.*

U.S. Geological Survey. 1975. Topographic Map of the Rico Quadrangle, Colorado.

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX A**  
**AGENCY/PERSONAL CONTACT LIST**

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX A**

**AGENCY/PERSONAL CONTACT LIST**

The following agencies/people have been contacted for this Phase I ESA conducted on an area in and around Rico, Colorado.

Mr. Wayne Webster - Subject property owner

Mr. Stan Foster - Rico realtor and resident

Dolores County Assessor

Pat Smith - EPA Project Manager, Rico-Argentine Mine

Denver Public Library - Sanborn Fire Insurance maps

Colorado Division of Natural Resources - Mine claim information

U.S. Bureau of Mines - Rick Salsbury

Colorado Division of Minerals and Geology - Maggie Van Cleef - Colorado Inactive Mine Inventory Problem Areas Data

U.S. Bureau of Land Management - Harriet Ohlerking - Mine claim information

U.S. Geological Survey - Historical topographic maps

CDPHE - Hazardous Materials and Waste Management Division; Water Quality Division

***PRIVILEGED AND CONFIDENTIAL***

**APPENDIX B**

**SITE PHOTOGRAPHS**

# Poor Quality Source Document

The following document  
images have been  
scanned from the best  
available source copy.

To view the actual hard copy,  
contact the Superfund Records  
Center at (303) 312-6473.

## PHOTOGRAPHIC RECORD



Photo 1. Area east of the former acid plant where the tree kill occurred. Facing southeast.



Photo 2. Treatment ponds at Rico-Argentine Mine. Facing west.

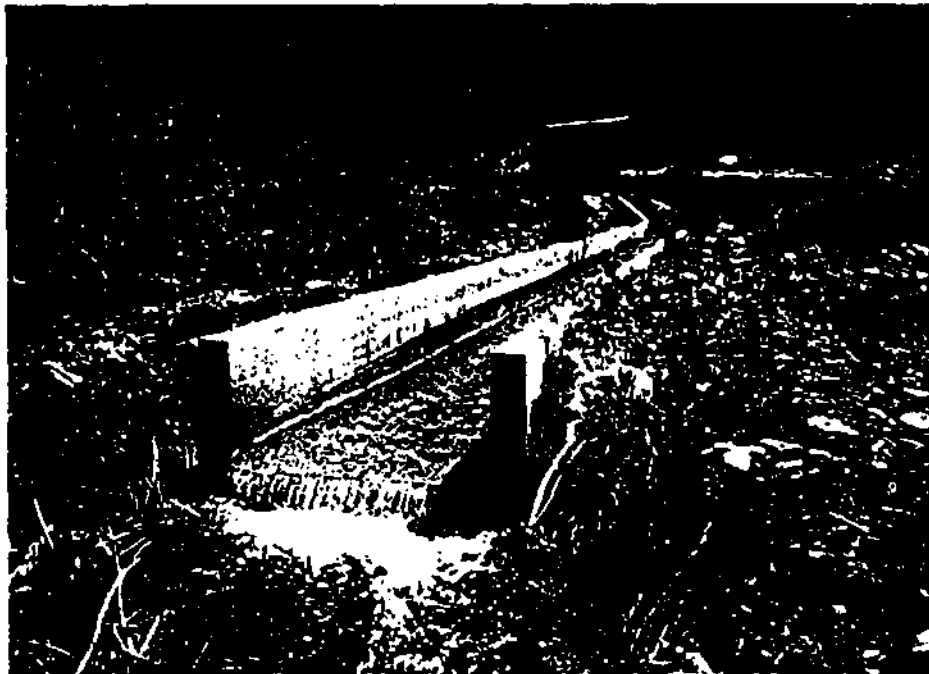


Photo 3. The St. Louis Tunnel discharging water from the treatment ponds shown in Photo 2.



Photo 4. Small pond south of Rico and east of Dolores River with large area of mine tailings. Facing northeast.



Photo 5. Drainage leading from pond in Photo 4 that flows to the Dolores River. Facing north.



Photo 6. Tailings pile and contaminated pond east of the ABG Mine and the Dolores River. Facing west.



Photo 7. Discharge from the Rico-Argentine Mill site that discharges to Silver Creek. Facing west/southwest.



Photo 8. Drainage from the Mountain Springs Mine that flows to the Dolores River. Facing northwest.



Photo 9. Waste rock at the Lexington Mine southeast of Rico. Facing east.



Photo 10. Debris disposed at a small dump site south of Rico.

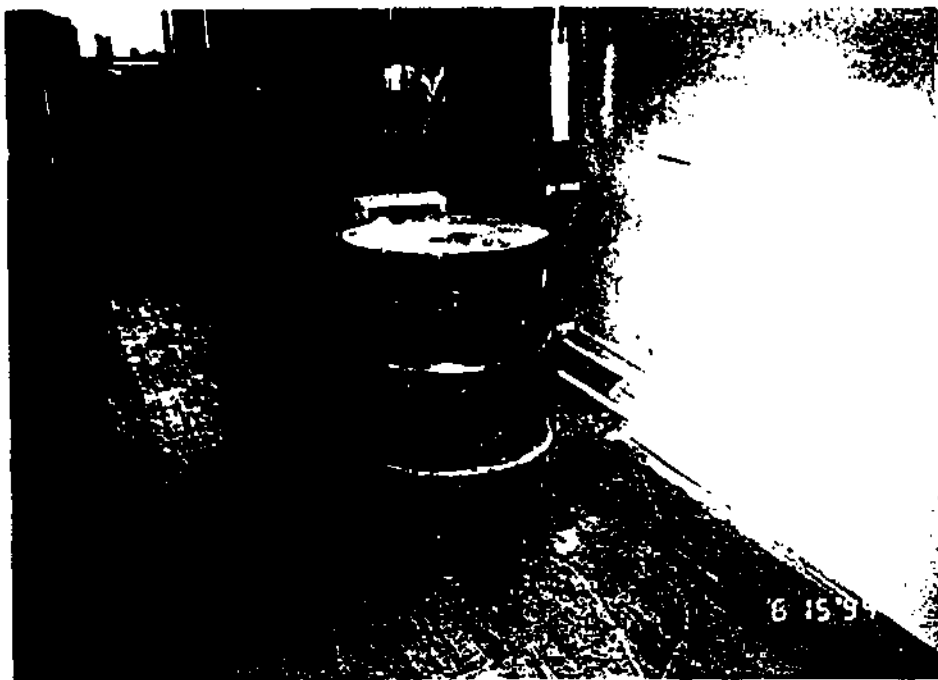


Photo 11. Drum in Burley Building that reportedly contains kerosene.



Photo 12. Interior of Assay Building showing chemical containers on counter and floor.



Photo 13. Excavated trenchline along north side of Assay building. Facing east.



Photo 14. Septic tank location on east side of Assay building. Facing north.



Photo 15. Perforated PVC leach line on the north side of the Assay building.



Photo 16. Test pit near the southwest corner of the property where sample SP06 was taken. Facing northwest.



Photo 17. Trench excavated near proposed road location in former town dump.



Photo 18. Excavated debris from trench dug in the former town dump.



Photo 19. Trench excavated in former town dump showing small amount of debris.



Photo 20. Former underground storage tank location at previous CDOT facility with 55-gallon drums stored outside the building. Facing east.

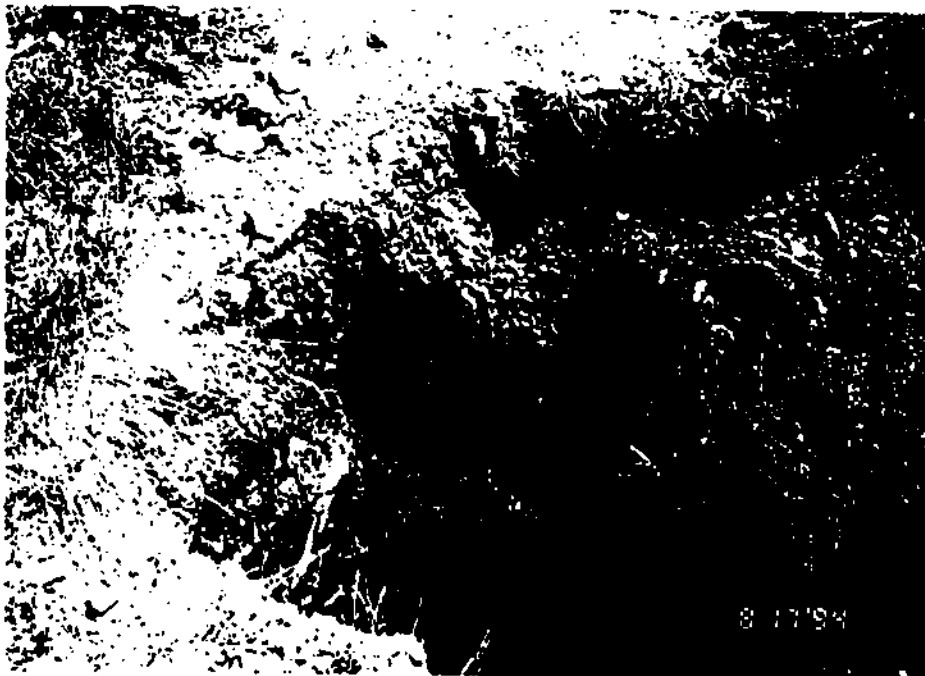


Photo 21. Tank piping in center of photo where contaminated soil was identified.

***PRIVILEGED AND CONFIDENTIAL***

**APPENDIX C**  
**MAP UNITS**

***PRIVILEGED AND CONFIDENTIAL***

**TABLE 2 MAP UNITS**

**AH:** Avalanche hazard area. These areas consist of avalanche chutes and exhibit evidence of recent avalanches.

**AI/MW:** Alluvium mixed with mine waste material. These deposits consist of rounded alluvial gravel and cobbles, and sediments mixed with various types of mine waste material, including mineralized waste rock and at times mill tailings. This map unit occurs along the floodplains of the Dolores River and Spring Creek.

**AI/T:** Alluvium mixed with mill tailings. This map unit consists of alluvial material that is mixed with mine mill tailings. These deposits occur along portions of the floodplains of the Dolores River.

**AMD:** Acid mine drainage deposits. This map unit consists of fine grain, iron-stained sediments and occur in areas that drain several of the mine sites. These deposits are generated from acids produced from sulfides that occur in mill tailings and mineralized waste rock.

**BC:** Buildings and concrete. This map unit consists of buildings and concrete and little or no soil material. This unit occurs along Glasgow Avenue.

**C/F/A:** Clinkers and fill material mixed with alluvium. This map unit consists of clinkers (generated from train engines) and fill material (including brick fragments, coal and charcoal) mixed with alluvial gravel and cobbles. This unit occurs at the former train depot.

**CMD:** Contaminated Mine Drainage. This map unit consists of areas where stormwater has carried contaminants from tailings piles and mine waste areas downgradient to surface water. The impacted surface waters are the Dolores River and Silver Creek.

**C/MW:** Clinkers mixed with mine waste. This map unit consists of clinkers, which were generated from train engines, mixed with mine waste. The mine waste includes both mill tailings and mine waste rock. This unit occurs at the former train depot adjacent to a tailings impoundment.

**DA:** Disturbed alluvium. This map unit is composed of alluvial material including sediments, gravel, and cobbles that have been disturbed by construction activities. This unit occurs along the Dolores River and at the confluence with Silver Creek.

**DD:** Dump debris. This unit consists of dump debris and fill about three feet thick. The debris contains glass, brick, porcelain, and metal fragments, and plastic. This unit occurs in one area along the Dolores River.

**DS:** Disturbed soil. This map unit consists of native soil that has been disturbed by construction activities. This unit occurs in portions of Block 19 and 20.

**F:** Fill material. This map unit may consist of any of the following materials: alluvial gravel and cobbles; native soil that has been used as fill; brick, metal, and glass fragments; lumber; and coal and charcoal. This unit was identified within the Rico town limits.

***PRIVILEGED AND CONFIDENTIAL***

**F/MW:** Fill material mixed with mine waste. This map unit consists of various types of fill material mixed with angular mineralized mine waste rock. This unit occurs in a couple locations within the Rico town limits.

**F/T:** Fill material mixed with mill tailings. This map unit consists of construction fill including bricks and milled lumber, mill tailings, and some mine waste rock. This unit occurs on the west side of Rico at the former Pro Patria Mill site.

**LUST:** Leaking Underground Storage Tanks. This map unit may or did contain USTs. This unit occurs within the Rico town limits.

**MW:** Mine waste. This map unit consists of mine waste spoils and other materials associated with mine sites, such as lumber, shaft and adit openings, shaft headframes, and mine buildings. This map unit occurs at most mine sites in the study area.

**MW/BA:** Mine waste and borrow area. This map unit consists of mine waste rock and talus and slope wash material, some of which has been removed and probably used as fill material to cover tailings impoundments. This unit occurs east of the former acid treatment plant.

**NS:** Native soil. This map unit consist of native soil which is generally free of any types of visible mine waste under a cursory inspection. The native soils were derived from fans, talus and slope wash, landslide deposits, and various types of sedimentary and igneous rocks.

**S/MW:** Slag mixed with mine waste. This map unit consists of slag, probably from smelting operations, mixed with mineralized and angular mine waste rock. This unit occurs at the Homestake claim on the north side of Rico.

**TI:** Tailing impoundments. This map unit consists of the fine grain mill tailings impoundments. Tailing impoundments occur at the Argentine mill site, and at several localities along the Dolores River.

**WL/T:** Wetlands and tailings. This map unit consists of wetlands that contains some mill tailings. This unit occurs along the floodplains of the Dolores River.

**WT:** Wetlands. This map unit consists of areas that may contain Corps of Engineers jurisdictional wetlands. These areas possibly contain hydric soils and wetland vegetation. This map unit occurs along the floodplains of the Dolores River.

**WWP:** Wastewater Ponds. This map unit consists of wastewater ponds used to treat water from the St. Louis tunnel. The water from the ponds discharges to the Dolores River.

**PRIVILEGED AND CONFIDENTIAL**

**APPENDIX D**  
**RISK RANKINGS**

What  
happened  
to  
RS-3 RP 2  
RS-7  
RS-9  
RS-11

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
A.B.G.	676	west 1/4	MW/NS		High	contains mine waste	
		east 1/4	MW/NS		High	contains mine waste	
		center	NS		Med.	close proximity to mine waste	sample surface soils
Aetna	1956	west 1/2	MW/NS		High	contains mine waste	
		east 1/2	NS		Low	native soil, up grad. from mine waste	
Aetna	6796	west 2/3	NS		Low	native soil	
Alta	6191		NS		Low	native soil	
Apex	11583A		MW/NS		High	contains mine waste	
Argentine	15233		NS		Med.	may contain mine drainage	sample surface soils
Aspen	6512	west 1/2	MW/NS		High	contains mine waste	
		east 1/2	NS		Low	native soil, up grad. from mine waste	
Avalanche	1682		NS		Med.	down grad. from mine waste	sample surface soils
Bald Eagle	10122		NS		Low	native soil	
Barnum	7365		NS		Low	native soil	
Bed Rock	8030		NS		Low	native soil	
Bell	5911		NS		Low	native soil	
Bertha S.	1955A		NS		Low	native soil	
Big Blue	7365		NS		Low	native soil	
Big Strike	7601	west 2/3	TP/MW		High	tailings, mine waste	
		east 1/3	NS		Low	native soil, up grad. from mine waste	
Black Chief	1649		NS		Low	native soil	
Black Cloud	8098		NS		Low	native soil	
Black George	2485		NS		Low	native soil	
Black Hawk	20568		NS		Low	native soil	
Black Night	8135		NS		Low	native soil	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Bourbon	5132		NS		Low	native soil	
Brittle Silver	7458		NS/MW		Med.	possible mine waste	sample soils & survey
Buckeye & Ma	7894		NS		Low	native soil	
Buehler	20738		MW/NS		High	contains small mine waste piles	
Bullion	7599	north 1/4	MW/NS		High	contains mine waste	
		south 3/4	NS		Low	native soil, up grad. from mine waste	
Burghard	8070		MW/NS		High	contains mine waste	
C.H.C.	1040		NS		Med.	close proximity to mine waste	survey claim, sample surface soils
C.H.R.	20740		NS		Low	native soil	
C.V.G.	6725	west 1/3	NS/MW/CMD		High	mine waste, contaminated drainage	
		east 2/3	NS		Low	native soil	
Caledonia	10122	west 1/2	NS		Low	native soil	
		east 1/2	NS		Med.	contains small mine shaft	sample surface soils, inspect shaft
Caselton	20740		NS		Low	native soil	
Cashier	15233		MW/ NS		High	contains mine waste	
Catskill	7062		MW/NS/TP		High	contains mine waste & tailings	
Cerebus	19665		NS		Low	native soil	
Chestnut	435		MW/NS		High	contains mine waste	
Clen Campbell	1807	north 1/4	MW/NS		High	contains mine waste	
		south 3/4	NS		Low	native soil, up grad. from mine waste	
Cobbler	5274		NS		Low	native soil	
Columbia Mills	365B		S/MW/NS		High	slag, mine waste	
Confidence	1447		NS		Low	native soil	
Contact	6895		NS		Low	native soil	
Contention No.	7565		NS		Low	native soil	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Cornucopia	11667		NS		Low	native soil	
Crebec	6130	NW 1/4	NS		Med.	contains small waste dump	sample dump
		SE 3/4	NS		Low	native soil	
Cross	940		NS		Low	native soil	
Crown Point	7365		NS		Low	native soil	
D. And B.B.	8539		NS		Low	native soil	
Dayton	2540		NS		Low	native soil	
Dayton No.2	11636		NS		Low	native soil	
Denver	7601	west 2/3	NS/MW/	RS-10	High	mine waste tailings, 160 mg/kg Pb in NS	
		east 1/3	NS		Low	native soil, up grad. from mine waste	
Devide	20568		NS		Low	native soil	
Dude	7049		NS		Low	native soil	
Dudess	7049		NS		Low	native soil	
E.R.G.	7013		NS		Low	native soil	
Eclipse	7269		NS		Med.	close proximity to mine waste	sample surface soils
Eighty-Eight	7348		NS		Low	native soil	
Ella D.	5659		MW/NS		High	contains mine waste	
Elliott	1536A		NS		Med.	proximity to slag and mine waste	
Elliott Millsite	1536B		TI		High	contains tailings Impoundment	
Enterprise	5916	west 1/3	MW/NS		High	contains mine waste	
		east 2/3	NS		Low	native soil, up grad. from mine waste	
Ethlena	6136	north 1/2	NS		Med.	close to mine waste, small mine shaft	sample surface soils, Inspect shaft
		south 1/2	MW/NS		High	contains mine waste	
Eureka	1880	north 1/3	NS		Med.	contains small adit	sample surface soils, Inspect adit

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
		south 2/3	NS		Low	native soil	
Eureka	6285		NS		Low	native soil	
Evening Call	8029		NS		Low	native soil	
Evening Star	7565		NS		Low	native soil	
Excelsior	1451A		NS		Low	native soil	
Excelsior Millsit	1451B		NS		Low	native soil	
Excelsior	8141		NS		Low	native soil	
Excelsior No.2	8141		NS		Low	native soil	
Exchequer	5132		MW/NS		High	contains mine waste	
Falcon	2151	west 2/3	NS		Med.	close to mine waste, small adit	sample surface soils, inspect adit, survey claim
		east 1/3	NS		Low	native soil	
Florence	1452A		NS		Low	native soil	
Fraction	11814		NS/AH		Low	avalanche hazard area	
Franklin	564	center	NS		Med.	close proximity to mine waste	survey claim, sample surface soils
		west 1/3,ea	MW		High	contains mine waste	
G.L.P.	8017		NS		Low	native soil	
Gem of Beauty	7164		NS		Low	native soil	
Gen. Logan	2476		MW/NS		High	contains mine waste	
Gen. O.O How	2478		NS		Low	native soil	
Gen. Sheridan	2479	west 1/3	MW/NS		High	contains mine waste	
		east 2/3	NS		Low	native soil, up grad. from mine waste	
Gen. Sherman	2477		MW/NS		High	contains mine waste	
Gertie	781		MW/NS		High	contains small mine waste dump	
Gipsy	2499		MW/NS		High	contains mine waste	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Golden Age	5956		NS		Med.	close proximity to mine waste	
Golden Fleece	2261	west 1/3	MW/NS		High	contains mine waste	
		east 2/3	AH/NS		Low	avalanche hazard area	
Goliath	19665		NS		Low	native soil	
Grand View	383	NW 1/2	NS		Low	native soil	
		SE 1/2	NS		Med.	contains small adit	sample surface soils, inspect adit
Group Millsite	11583B		NS/MW		High	may contain mine waste	survey claim, sample surface soils
H.B.	7013		NS		Low	native soil	
Hal Pointer	8017		NS		Low	native soil	
Half Loaf	8017		NS		Low	native soil	
Hardscrabble	8070		MW/NS		High	contains mine waste	
Harvey	914	east 1/3	MW/NS		High	contains mine waste	
		west 2/3	NS		Med.	native soil, up grad. from mine waste	
Hiawatha	6393		NS		Low	native soil	
Highland Chief	8017		NS		Low	native soil	
Hillside	7994		NS	Hillside	High	native soil, mine waste on road, 2800 mg/kg Pb	
Hillside No.2	7994		NS	Hillside	High	native soil, mine waste on road, 9100 mg/kg Pb	
Home	8031		NS	Home	Low	native soil, 300 mg/kg Pb	
Homestake &	410		TI/S/MW	RS-13	High	contains tailings, slag, and mine waste, 4800 mg/kg Pb	
Honduras	7843		NS		Low	native soil	
Hope	939		NS		Low	native soil	
Humbolt	15233	north 1/2	NS		Med.	close proximity to mine waste	sample surface soils
		south 1/2	MW/NS		High	contains mine waste	
Independent	7601	north 1/4	MW/NS		High	contains mine waste	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Ingersol	413	south 3/4	NS		Low	native soil, up grad. from mine waste	
		east 1/4	MW/NS		High	contains mine waste	
		west 3/4	NS		Low	native soil, up grad. from mine waste	
Iron Clad	1428		MW/NS		High	contains mine waste	
Iron Rod	8140		NS		Low	native soil	
Isabelle	2039		AH/NS		Low	avalanche hazard area	
James Blaine	15233	south 1/2	MW/NS		High	contains mine waste	
		north 1/2	NS		Med.	close proximity to mine waste	sample surface soils
Kearney	5133	NW 1/4	MW/NS		High	contains mine waste	
		SE 1/4	MW/NS		High	contains mine waste	
		center	NS	RS-08	Med.	close proximity to mine waste, 140 mg/kg Pb	
Kitchen	5917		MW/NS/AH		High	contains mine waste, avalanche hazard	
Last Chance	20388		NS		Med.	may contain small shaft	survey claim and sample surface s
Last Chance	6512		NS		Med.	close proximity to mine waste	survey claim and sample surface s
Last Chance	8622		MW/NS		High	contains mine waste	
Laura	5913	south 1/2	AH/MW	RP-01	High	avalanche hazard, mine shaft, 8500 mg/Kg Pb	
		north 1/2	NS		Low	native soil	
Leap Year	6105	north 2/3	NS		Low	native soil	
		south 1/3	NS		Med.	close proximity to mine waste	sample soils
Lelia Davis	1256		NS		Low	native soil	
Little Bernard	6406		NS		Low	native soil	
Little Carrie	6960		NS		Low	near avalanche hazard area	
Little Casper	19665		NS		Low	native soil	
Little George	8017		NS		Low	native soil	
Little George	8017		NS		Low	native soil	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Ext.							
Little J. Horner	20740		NS		Med.	native soil, possible mine waste on sample soils, survey W. side	
Little Johnny	10122		NS		Low	native soil	
Little Lulu	8017		NS		Low	native soil	
Little Maggle	8070		NS		Low	native soil	
Lone Tree	12303		AH		Low	avalanche hazard area	
Lookout	1683	north 1/3	MW/NS		High	contains mine waste	
		south 2/3	NS		Low	native soil, up grad. from mine waste	
Lota	6154		NS/MW		High	mine waste	
Lottie	8223		NS		Low	native soil	
Lowland Chief	8017		NS		Low	native soil	
Lucy	1456		NS		Low	native soil	
Mald of Aust.	1587		NS		Low	native soil	
Major	384	SE 1/2	NS		Med.	contains small adit	sample surface soils, inspect adit
		NW 1/2	NS		Low	native soil	
Mammoth	20500		MW/NS		High	contains mine waste	
Mariquita	1450		NS		Low	native soil	
Martha	20619		MW		High	contains mine waste and former acid plant	
Mary	6205	north 1/2	MW/NS		High	contains mine waste	
		south 1/2	NS		Low	native soil, up grad. from mine waste	
McIntire	12302		NS		Low	close to avalanche hazard area	
Merrimac	962		NS		Low	native soil	
Mervin	20619	east of river	WL		High	wetlands and former acid plant	
		west of rive	WL/NS	RS-06	Low	native soils & wetlands, 90 mg/kg Pb	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Millie	7988	north 1/2	MW/NS		High	contains mine waste	
		south 1/2	NS		Low	native soil, up grad. from mine waste	
Monarch	20387		MW/NS		High	contains mine waste	
Mountain Boy	20387		NS		Low	native soil	
Mtn. Monarch	1454		NS		Low	native soil	
Mtn. Spring	6129		MW/NS		High	contains mine waste	
Nancy Hanks	8017		NS		Low	native soil	
N.A. Cowdrey	6317	west 3/4	NS		Low	native soil	
		east 1/4	NS		High	may contain mine waste	survey claim
New Discovery	1461A	west 3/4	NS		Low	native soil	
		east 1/4	NS		Med.	contains small mine waste dump	sample dump
New Year	1538	west 2/3	MW		High	contains mine waste	
		east 1/3	AH/NS		Low	avalanche hazard area	
Night Watch	5976		NS		Low	near avalanche hazard area	
Nora Lilly	1010	NE 1/2	MW/NS		High	contains mine waste	
		SW 1/2	NS		Med.	close proximity to mine waste	sample soils
Ontario	5923		AH/MW		High	avalanche hazard area, mine waste	
Pasadena	6434		NS		Low	native soil	
Paymaster	997	north 1/2	MW/NS		High	contains small mine waste dump	sample waste dump
		south 1/2	NS		Low	native soil	
Pelican	363		MW, NS		High	contains mine waste	
Peru	1455		NS		Low	native soil	
Pewer Dollar	8098		NS		Low	native soil	
Phoenix	362		MW/NS		High	contains mine waste	
Pigeon	665		MW/NS		High	contains mine waste	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Pittsburgh	941		NS		Low	native soil	
Pluto	8985		NS		Low	native soil	
Premier	5132	south 3/4	NS		Low	native soil	
		north 1/4	NS		Med.	contains small adit	sample soils, inspect adit
Princeton	2258		MW		High	mine waste	
Pro Patria No.1	unkno	SE 1/4	AH		Low	avalanche hazard area	
		NW 1/4	NS		Low	near avalanche hazard area	
Pro Patria No.7	unkno	SE 1/2	AH		Low	avalanche hazard area	
		NW 1/2	NS		Low	near avalanche hazard area	
Redeemer	12304		NS		Low	native soil	
Robber State	1464		NS		Low	native soil	
Roger Tighbor	7784		NS		Med.	close proximity to mine waste	sample surface soils
Royal Turk	8020		NS		Low	native soil	
S.M.G.	7986		NS		Low	native soil	
Sam Patch	8031		NS	S. Pat	High	native soil, mine waste & fill, 12,000 mg/kg Pb	
Santa Clara	664	east 1/2	NS		Low	native soil	
		west 1/2	NS		High	mine waste	
Santa Cruz	6132	east 1/4	NS		Low	native soil	
		west 3/4	NS		Med.	close proximity to mine waste	sample surface soils
Selenide	7459		NS		Med.	close proximity to mine waste	sample surface soils, survey
Shamrock	5832	east 1/4	MW/NS	RP-04	High	contains mine waste, 4.3 mg/L TCLP-Pb, 0.66 mg/L TCLP-Cd	
		west 3/4	NS		Low	native soil, up grad. from mine waste	
Shehocton	8017		NS		Low	native soil	
Silver Age	5831	west 2/3	NS		Med.	contains small mine workings	sample surface soils, inspect workl

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Silver Belt	8020	east 1/3	AH		Low	avalanche hazard area	
			NS		Low	native soil	
Silver Cache	1655		NS		Low	native soil	
Silver Glance	6201		MW/NS		High	contains mine waste	
Silver Gl. No.2	6201	west 1/2	MW/NS		High	contains mine waste	
		east 1/2	NS		Med.	native soil, up grad. from mine waste	
Silver Gl. No.4	7976		NS		Med.	native soil, downgrad. from mine waste	
Skeptical No.1	1900	south 1/3	NS		Low	native soil	
		north 2/3	AH/NS		Med.	avalanche hazard and small shaft	
Slide	20740		NS		Low	native soil	
Slide-Top	20740		NS		Low	native soil	
Smuggler	5912		NS	Smug- gler	High	native soil, mine waste on road, 420 mg/kg Pb	
Snowflake	5909		NS		Low	native soil	
Snow Flake	6216	east 1/4	MW/NS		High	contains mine waste	
		west 3/4	NS		Med.	native soil, up grad. from mine waste	
South Park	1563		NS/MW		High	native soil	mine waste on e. and w. ends
Stanley No.1	6095	east 1/3	AH		Low	avalanche hazard area	
		west 2/3	NS		Low	near avalanche hazard area	
Stanley No.2	6095		NS		Low	native soil	
Stanley No.3	6095		NS		Low	native soil	
Star	6199		NS		Low	native soil	
Star Route	5970		NS		Low	native soil	
Stephanite	7980		NS		Low	native soil	
Stony Point	1489		NS		Low	native soil	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
Sun Up	5910		AH/MW/NS		High	avalanche hazard, mine waste	
Syndicate	2185A	north 1/4	MW/NS		High	contains mine waste	
Telegraph	780		NS		Low	native soil	
Thompson	6394		MW/NS		High	contains mine waste	
Timberline	20740		NS		Low	native soil	
Tip Top	1248		NS		Low	native soil	
Tom Thumb	20740		NS		Low	native soil	
Town of Rico Tract			NS		Low	native soil	
Trails End	20568		NS		Low	native soil	
Triangle	20347	west 1/3	MW/NS		High	contains mine waste	
		east 2/3	NS		Med.	native soil, up grad. from mine was sample soil	
Tunnelsite			NS		Low	native soil	
Uncle Ned	915		MW/NS		High	contains mine waste	
Undine	1090		NS/MW		High	mine waste, small adit	sample surface soils, inspect adit
Vestal	6252	west 1/2	MW/NS		High	contains mine waste	
		east 1/2	NS		Low	native soil, up grad. from mine waste	
Wabash	617	south 1/2	MW/NS		High	contains mine waste	
		north 1/2	NS		Med.	native soil, close proximity to mine	sample soils
Wellington			NS		Med.	close proximity to mine waste	sample soils, survey claim
W.L. Stevens	7017	west 1/2	MW/NS		High	contains mine waste	
		east 1/2	NS		Med.	close proximity to mine waste	sample soils
Worlds Fair	15233		MW/NS		High	contains mine waste	
X-Ray	19665		NS		Low	native soil	
Yankee Boy	6969		NS	Y. Boy	High	native soil, trench & road with mine waste, 6,500 mg/kg Pb	
Yellow Jacket	364	west 1/2	MW/NS		High	contains mine waste	

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF MINING CLAIMS IN STUDY AREA

Claim	M.S.	Fraction*	Map Unit	Sampl	Risk	Comments	Pre-acquisition Recommendations
		east 1/2	NS		Med.	close proximity to mine waste	sample surface soils
Zona K.	8228		NS		Med.	close proximity to mine waste	sample surface soils
Zulu	1452A		NS		Low	native soil	

\* fractions of claims are estimated

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF RICO CITY BLOCKS AND TRACTS

Block/Track	Lot	Map Unit	Risk	Sample	Comments	Pre-acquisition Recommendations
Block 1	3-6	BC	Medium*		adjacent to LUST property and elevated Pb fill	evaluate LUST property, conduct asbestos survey, dispose of chemicals
Block 1	17-20	F	High	RS-18	fill material of unknown origin	830-1400 mg/kg Pb
Block 1	39-40	F/MW	High	RS-02	contains mine waste, 230-1500 mg/kg Pb	determine remediation options
Block 1	36-38	F/MW	High	T-03	contains mine waste, 21 mg/kg TCLP Pb	determine remediation options
Block 2	9-12	F	High	RS-16	fill material of unknown origin, 650-750 mg/kg Pb	
Block 4	39, 40	NS	Low		native soil	
Block 6	39, 40	F	Unknown	RS-14	fill material of unknown origin	sample not analyzed at client's request
Block 10	1-40	NS	Low	BK 10	native soil, 190 mg/kg Pb	
Block 11	2-4	NS	Low		native soil	
Block 11	11-29	NS	Low	BK 11	native soil, 62 mg/kg Pb	
Block 11	32-34	road	Low		road	
Block 12	23-26	F	High		fill material of unknown origin	sample soils
Block 13	12-16	LUST	High*	DOT 1,2,3	810 mg/kg TVH	dispose of drummed waste
Block 14	21-28	F	Medium*		former assay office	dispose of chemical wastes, sample surficial fill material
Block 14	31-40	F	Medium	RS-04	low metal conc., Cd slightly elevated	
Block 19	1-3	NS	Low		native soil	
Block 19	7-9	DA	Medium		adjacent to elevated Pb sites	sample soils
Block 19	11-20	DA/DS	High	RS-22	disturbed soil, 2000 mg/kg Pb	
Block 19	21-25	AI/MW	High		contains mine waste material	
Block 19	30-35	DA	High	RS-23	disturbed soil, 800 mg/kg Pb	
Block 19	36-40	WL	Medium		adjacent to elevated Pb sites	delineate wetlands, sample soils

TABLE 3 ENVIRONMENTAL HAZARD RANKING OF RICO CITY BLOCKS AND TRACTS

Block/Track	Lot	Map Unit	Risk	Sample	Comments	Pre-acquisition Recommendations
Block 20	SE	MW	High	RP-03	former Atlantic Cable Mine site, 7000 mg/kg Pb	
Block 20	21-40	DS/MW	High	RS-21	disturbed soil, 3400 mg/kg Pb	
Block 21	1	F/MW	High	RS-15	contains mine waste, 3900 mg/kg Pb	
Block 21	4	NS	Medium		native soil adjacent to elevated Pb site	sample soils
Block 24	21-30	MW	High		contains mine waste	
E. of Block 24		NS	High		contains debris, close to mine waste	sample soils
Block 25	1-14	AI/MW	High	RS-28	contains mine waste, 3500 mg/kg Pb	
Block 25	15-28,35-40	WL	Medium		adjacent to elevated Pb sites	sample soils
Block 25	29-34	MW	High		mine waste	
Block 28	1-20	F/DS/MW	High		contains mine waste, 1000 mg/kg Pb	
Block 29	1-5	NS	Low		native soil	
Block 38	21-40	NS	Low	BK 38	native soil, 84 mg/kg Pb	
Block 39	1-20,28-40	NS	Low	BK 39	native soil, 96 mg/kg Pb	
Block 39	21-27	L	Medium		former town dump	
AE Arms Tract N.	(west 1/2)	NS	Medium		close proximity to high risk	sample soils
AE Arms Tract N.	(east 1/2)	WL,MW	High	RS-26	wetlands, contains mine waste, old landfill debris, 1600 mg/kg Pb	
AE Arms Tract	(west 1/3)	NS	Medium		close proximity to high risk	sample soils
AE Arms Tract	(east 2/3)	MW	High	RS-27	mine waste, elevated Cd,Mn,Ag	
AE Arms Tract S.	(west 1/2)	NS	Medium		close proximity to mine waste	sample soils
AE Arms Tract S.	(east 1/2)	WL	Low		possible wetlands	delineate wetlands
Atl. Cable Sub.	41-44	NS	Low	RS-05	native soil, 280 mg/kg Pb	
FG Day Tract	(west 1/3)	NS	Medium		close proximity to mine waste	
FG Day Tract	(east 2/3)	MW	High		mine waste	
Graveyard Tr.		NS	Low			
Group Tract		NS	Low	RS-01	native soil, 100-260 mg/kg Pb	

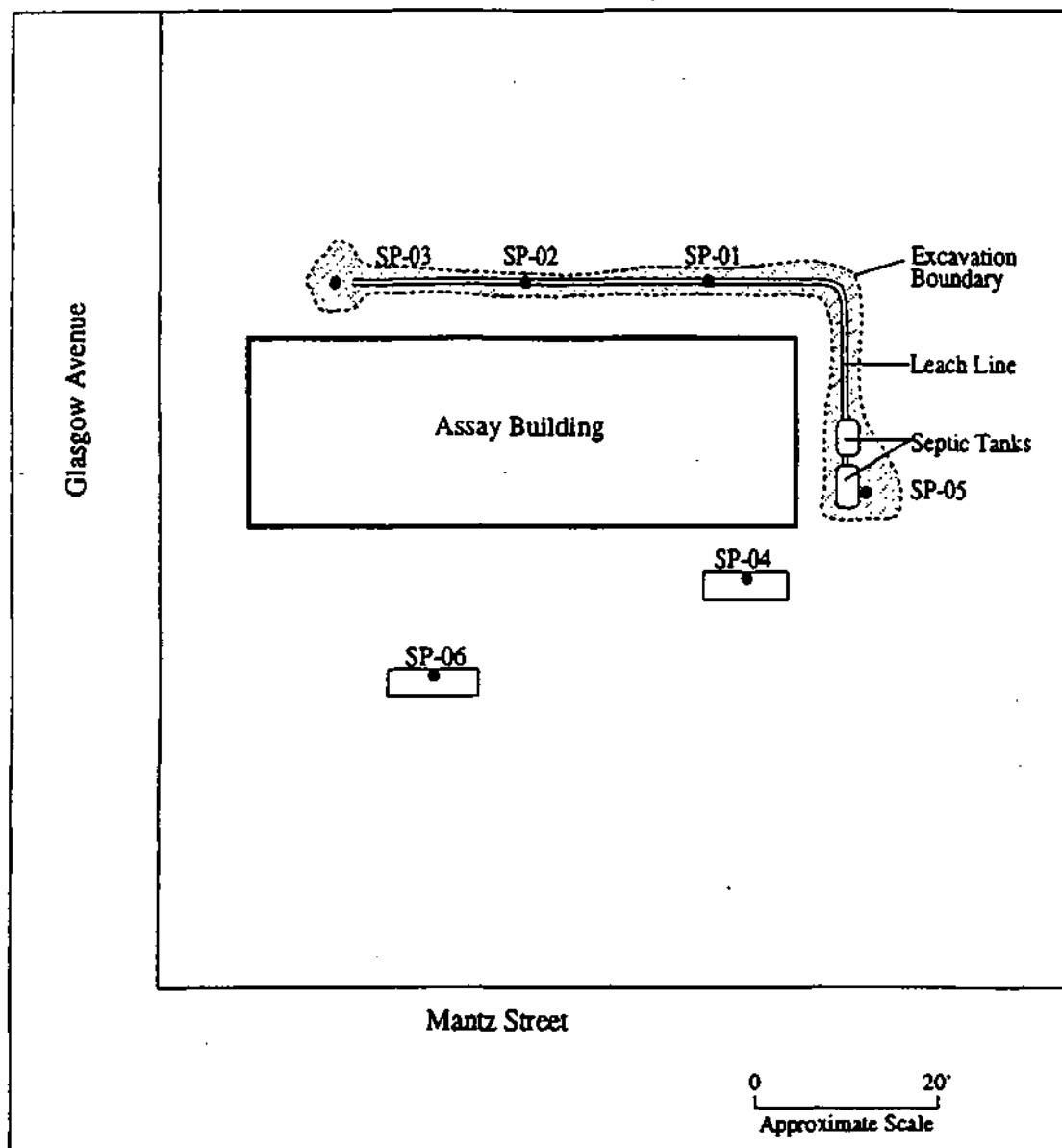
TABLE 3 ENVIRONMENTAL HAZARD RANKING OF RICO CITY BLOCKS AND TRACTS

Block/Track	Lot	Map Unit	Risk	Sample	Comments	Pre-acquisition Recommendations
Little ADA Tr. S.		NS	Low		native soil	
Little ADA Tr. N.		NS	Low	Ada N	native soil, 77 mg/kg Pb	
Max Boehmer Tr.	(west 3/4)	NS	Low		native soil	
Max Boehmer Tr.	(east 1/4)	WL	Low		possible wetlands	delineate wetlands
Pasadena Red. T.	(west 1/3)	WL	Low		possible wetlands	delineate wetlands
Pasadena Red. T.	(east 2/3)	NS	Medium		proximity to high risk	sample soils
Rico Smelting Tr.	(west 1/2)	WL,C/MW	High		wetlands and clinker with mine waste	sample soils
Rico Smelting Tr.	(east 1/2)	NS	Medium		proximity to high risk	sample soils
Rico Town Dump		L	Medium	T-01,2	former landfill	
Roy's Tract	(west 1/2)	WL/DA	High	RS-20	possible wetlands, contains fill 2000 mg/kg Pb	
Roy's Tract	(east 1/2)	C/F/A/A/T	High	RS-25	contains slag and mine waste, 1200 mg/kg Pb	
RGS Tract	(west 1/2)	WL	High	RS-19	possible wetlands, 12,000 mg/kg Pb	
RGS Tract	(east 1/2)	TP	High		tailings impoundment, contaminated stormwater discharge	
RGS Y	(west 1/3)	MW	High		contains mine waste	
RGS Y	(east 2/3)	WL	High		adjacent to tailings & mine waste	sample soils
Tremble Tract		A/T/C	High		contains mill tailings, clinker, mine waste	
Warner K. Patrick		NS	High	RS-17	native soil, 540-9,300 mg/kg Pb	
Winkfield Tr. East		TP/C/MW	High		mine waste, contaminated water discharge, tailings	
Winkfield Tr. West	(west 1/3)	MW	High		contains mine waste	
Winkfield Tr. West	(east 2/3)	WL	Medium		adjacent to tailings	sample soils
Winkfield Tract	(west 1/4)	MW	High		contains mine waste	
Winkfield Tract	(east 3/4)	WL	Medium		possible wetlands, adjac. to mine waste	sample soils

\* These sites may be reduced to low risk following completion of mitigation measures such as proper removal and disposal of chemicals stored at the buildings, completion of an asbestos survey, and characterization of soil contaminants.

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX E**  
**FIGURES OF STUDY AREA**



**Explanation**

SP-06 • Soil Sampling Location and Designation

N

**Walsh**

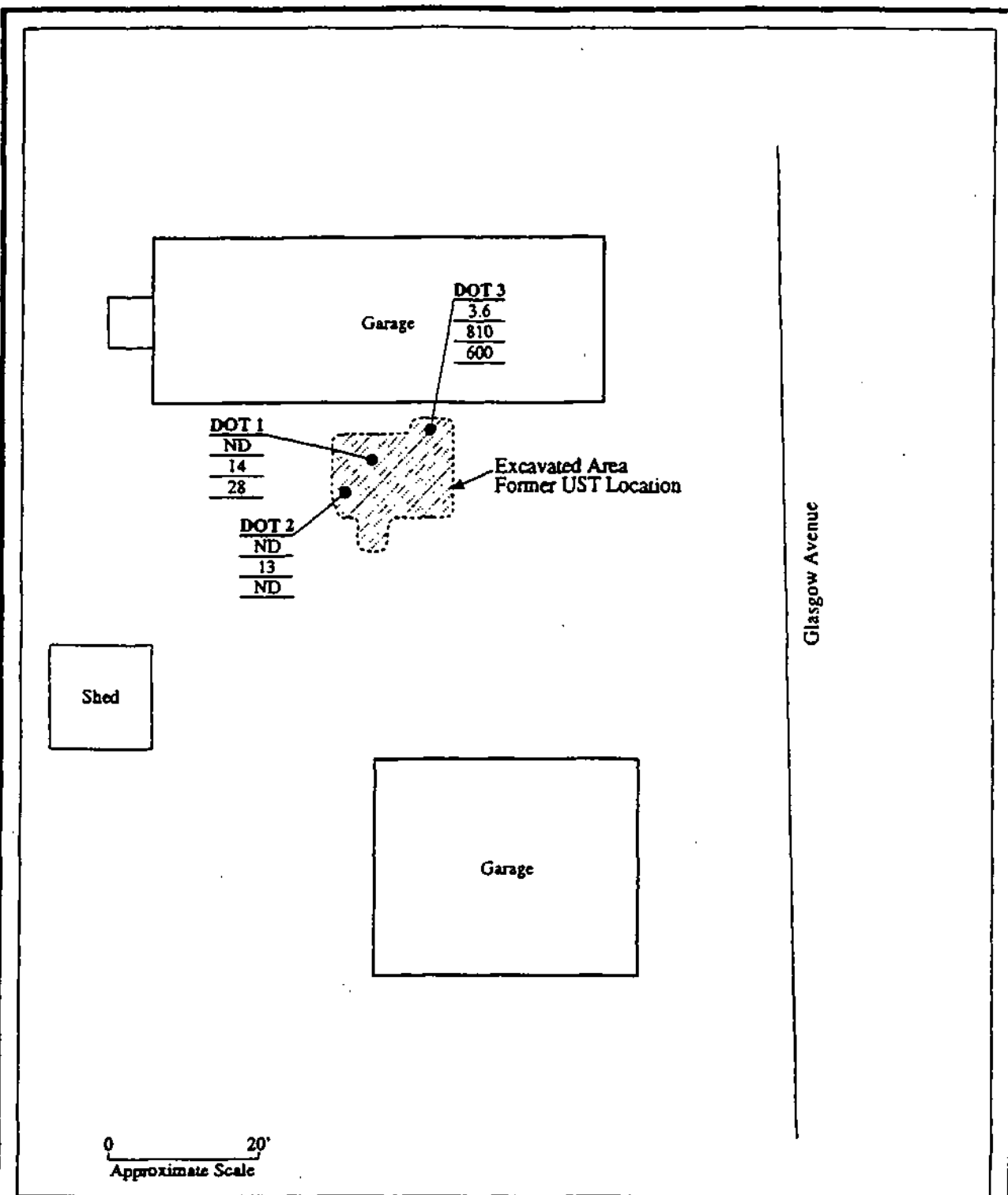
Environmental Scientists and Engineers, Inc.

**Site Map**

Job 1897-020

Date 8/94

Figure 5



#### Explanation

- Soil Sample Location, and Designation  
 DOT 2  
 BTEX mg/kg  
 TVH mg/kg  
 TEH mg/kg

N



**Walsh**

Environmental Scientists and Engineers, Inc.

#### Site Map

Job 1897-040

Date 8/94

Figure 6

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX F**

**TABLES OF SAMPLE DESCRIPTIONS AND ANALYTICAL  
RESULTS**

**PRIVILEGED AND CONFIDENTIAL**

**TABLE 4 SOIL SAMPLE DESCRIPTIONS**

RS-01: RS-01 was collected in coniferous forest from the Group Tract which is located on the south side of Rico. This sample was a three-point composite sample from 0 to 2 inches depth. The sample consists of native soil (map unit NS) derived from talus and slope wash material.

RS-02: RS-02 was collected from Block 1, lots 39 and 40 located behind Rico Properties. The sample was collected from the upper 4 inches from a 20-inch deep observation hole. From 0 to 20 inches, there was fill material consisting of alluvium, angular rocks containing iron staining (possibly mine waste rock), brick and metal fragments, and some coal and glass fragments. The sample is from map unit F.

RS-03: RS-03 was a three-point composite collected from Block 21, lot 1, which is located just east of the Atlantic Cable mine site. The sample was from 0 to 4 inches depth and consisted of fill material of alluvial cobbles and angular mineralized rocks (possibly mine waste rock). This sample is from map unit F/MW.

RS-04: RS-04 was collected from Block 14, lots 36-40 south of Silver Creek, east of Glasgow Avenue. This sample was a four-point composite from roughly 0 to 7 inches depth. The sample consisted of fill material, rounded to angular cobbles and gravel, and brick and glass fragments (map unit F).

RS-05: RS-05 was collected from the Atlantic Cable Subdivision in lots 41-44, which is located in northeast Rico. This sample was a three-point composite from 0 to 2 inches depth. The sample consisted of native soil (map unit NS) derived from various types of sedimentary rocks.

RS-06: RS-06 was collected north of Rico along the western floodplain of the Dolores River west of the former acid plant. This sample was a three-point composite from 0 to 2 inches depth. The sample consisted of native soil derived from alluvium and stream gravel and may be located in jurisdictional wetlands (map unit WL).

RS-07: RS-07 was collected uphill from the Spill mine (also known as Mountain Springs mine) in an area adjacent to mine workings. This sample was a three-point composite from 0 to 2 inches depth. The sample consisted of native soil (map unit NS) derived from sedimentary and igneous rocks.

RS-08: RS-08 was collected downhill from the Spill mine in an area adjacent to mine workings. This sample was a three-point composite from 0 to 2 inches depth. The sample consisted of native soil (map unit NS) derived from sedimentary and igneous rocks.

RS-09: RS-09 was a three-point composite collected in a drainage down-gradient from the Spill Mine. The drainage is stained red from iron precipitation from the mine site. The sample was from 0 to 2 inches depth and consisted of red-stained alluvial sediments generated by acid mine drainage (map unit AMD).

RS-10: RS-10 was collected in a stand of dead trees on the steep hillside just east of the former acid plant. This sample was a four-point composite from 0 to 2 inches depth and consisted of native soil (map unit NS) derived from talus and slope wash.

***PRIVILEGED AND CONFIDENTIAL***

RS-11: RS-11 was a two-point composite collected from Block 4, lot 40 and Block 2, lot 11 near the Rico Hotel. The sample was from 0 to 2 inches depth and consisted of native soil (map unit NS) derived from talus and slope wash.

RS-12: RS-12 was a four-point composite collected from Block 12, within lots 31 and 36 and Block 25, within lots 5 and 11. Blocks 12 and 25 are located on the west side of Rico in the floodplain of the Dolores River. The sample was from 0 to 2 inches depth and consisted of alluvium mixed with mine waste rock (map unit AI/MW).

RS-13: RS-13 was a four-point composite collected from the Homestake claim on the north end of Rico. The sample was from 0 to 2 inches depth and consisted of native material, slag, mine waste rock, and coal (map unit S/MW).

RS-15: RS-15 was a three point composite from 0 to 6 inches depth from Block 21, lot 1. The sample consisted of fill material (map unit F) mixed with native soil. The fill material contained some mineralized mine waste.

RS-16: RS-16 was collected from Block 2, lots 9-12. The sample was a three point composite from 0 to 8 inches depth. The sample consisted of both fill material and possible some native soil (map unit F).

RS-17: RS-17 was a three point composite from 0 to 2 inches depth collected from the Warner K. Patrick Tract. The sample consisted of native soil (map unit NS).

RS-18: RS-18 was collected from Block 1, lots 16-20. The sample was a three point composite from 0 to 5 inches depth and consisted of fill material and native soil (map unit F). The fill material contained charcoal and glass and porcelain fragments.

RS-19: RS-19 was a four point composite from 0 to 2 inches depth. It was collected from wetlands (map unit WL) along the east side of the Dolores River and west of Block 28.

RS-20: RS-20 was collected from wetlands along the east side of the Dolores River and west of Block 27. The sample was a four point composite from 0 to 2 inches depth and consisted of native soil (map unit WL).

RS-21: RS-21 was collected from Block 20, lots 21-27. The sample was a four point composite from 0 to 2 inches depth and consisted of disturbed native soil (map unit DS).

RS-22: RS-22 was collected from Block 19, lots 13-20. The sample consisted of native soil that has been disturbed by construction activities (map unit DS). The sample was a four point composite from 0 to 2 inches depth.

RS-23: RS-23 was collected from Block 19, lots 7-9 and 29-36. The sample consisted of alluvium disturbed from construction activities (map unit DA) and was a four point composite from 0 to 2 inches depth.

RS-24: RS-24 was collected from disturbed soil (map unit DS) from Block 28, lots 6-20. The sample was a four point composite from 0 to 2 inches depth.

***PRIVILEGED AND CONFIDENTIAL***

**RS-25:** RS-25 was collected from the former train depot site. The sample consisted of clinkers and fill material mixed with alluvium (map unit C/F/A). The sample was a four point composite from 0 to 2 inches.

**RS-26:** RS-26 was collected in dump debris (map unit DD) along the Dolores River. The sample was a three point composite from 0 to 6 inches depth.

**RS-27:** RS-27 was collected from wetlands (map unit WL) along the east side of the A.E. Arms Tract. The sample consisted of native soil and was a four point composite from 0 to 2 inches depth.

**RS-28:** RS-28 was collected from Block 25, lots 1-4. This sample consisted of disturbed alluvium and possibly some mine waste (map unit AI/MW). It was a four point composite from 0 to 2 inches depth.

**Smuggler:** This sample was collected from the Smuggler claim in northwest Rico. This sample was a four-point composite from 0 to 2 inches in depth. The sample contained native soil and road base materials.

**Yankee Boy:** This sample was collected from the Yankee Boy claim in northwest Rico. This sample was a four-point composite from 0 to 2 inches. This sample contained native soil and sediment from a trench.

**Hillside #2:** This sample was collected from the Hillside #2 claim in northwest Rico. This sample was a five-point composite from 0 to 2 inches. This sample contained native soil and road base material.

**Hillside:** This sample was collected from the Hillside claim in northwest Rico. This sample was a four-point composite from 0 to 2 inches. This sample contained native soil and road base material.

**Home:** This sample was collected from the Home claim in west Rico. This sample was a five-point composite from 0 to 2 inches. This sample contained native soil and road base material.

**Sam Patch:** This sample was collected from the Sam Patch claim in west Rico. This sample was a four-point composite from 0 to 2 inches. The sample contained fill and mine waste from the east part of the claim.

**Ada North:** This sample was collected from the Little Ada Tract North in south Rico. This sample was a four-point composite from 0 to 2 inches. The sample contained native soil.

**Group:** This sample was collected from the Group tract in south Rico. This sample was a six-point composite from 0 to 2 inches. The sample contained native soil, including soil from the area downgradient of the Apex claim mine waste pile.

**BK10:** This sample was collected from Block 10 in south Rico. This sample was a three-point composite from 0 to 2 inches. The sample contained native soil.

**BK11:** This sample was collected from Block 11 in south Rico. This sample was a three-point composite from 0-2 inches. The sample contained native soil.

**BK38:** This sample was collected from Block 38 in south Rico. This sample was a three-point composite from 0-2 inches. The sample contained native soil.

***PRIVILEGED AND CONFIDENTIAL***

**BK39:** This sample was collected from Block 39 in south Rico. This sample was a six-point composite from 0-2 inches. The sample contained native soil.

**Lots 17-20:** This sample was collected from Lots 17-20, Block 1 in Rico. This sample was a six-point composite from 0-2 inches. The sample contained fill material.

**School lots:** This sample was collected from Lots 9-12, Block 2 in Rico. This sample was a five-point composite from 0-2 inches. The sample contained fill material.

**Patrick:** This sample was collected from the Warner K. Patrick Tract in northeast Rico. This sample was a three-point composite from 0-2 inches. This sample contained native soil which had some orange staining evident.

**RP-01:** RP-01 was collected from a mine-waste spoil pile at the Laura Mine site, which is located about 1/2 mile east of Rico. This sample was a three-point composite from 0 to 2 inches depth. The sample contained mineralized (sulfides) waste material (map unit MW).

**RP-02:** RS-02 was collected from a mine spoil at the Lexington Mine site, which is located on the southeast side of Rico. This sample was a three-point composite from 0 to 2 inches depth. The sample contained mineralized waste material (map unit MW).

**RP-03:** RP-03 was a three-point composite from Block 20, lots 30 and 31 which is the former Atlantic Cable Mine site. This sample was from 0 to 3 inches and consisted of mineralized (pyrite and sphalerite) rock and soil (map unit MW).

**RP-04:** PR-04 was collected from a small mine waste dump (map unit MW) on the Shamrock claim. The sample consisted of dump material and was a three point composite from 0 to 6 inches depth.

**RA-01:** RA-01 was a discrete grab sample collected along Silver Creek down gradient from the Argentine tailings impoundments. The sample was from 0 to 4 inches depth and consisted of alluvium and mine waste (map unit Al/MW).

**T-01:** T-01 was collected from the former city landfill. The sample was a grab sample from 6 feet depth just above bedrock and consisted of reddish-brown sandy clay loam. Trash debris extended from 1.5 feet below the surface to bedrock.

**T-02:** T-02 was collected from the former city landfill. The sample was a grab sample from 14 feet below the surface and about one foot below the trash debris. The sample consisted of reddish-brown sandy clay loam. Trash debris extended from 1.5 feet below the surface to 13 feet depth.

**T-03:** T-03 was collected from Block 1, lots 36-38. The sample was a composite from 0 to 8 feet depth and consisted of fill material and possibly some mine waste material.

**Trench 1:** This sample was collected from Lot 40, Block 1. The sample was a three-point composite from the east end of a trench excavated to a depth of 3 feet. The sample was of fill material.

***PRIVILEGED AND CONFIDENTIAL***

Trench 2: This sample was collected from Lot 40, Block 1. The sample was a three-point composite from the west end of a trench excavated to a depth of 3 feet. The sample was of native soil with small amounts of fill material.

TABLE 5 METAL CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Location	Depth (in)	Map Unit	Al mg/kg	Sb mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg
RS-01	Group Tract	0-2	NS	17000	ND	ND	110	ND	ND	19	10	27	23000
RS-02	Blk 1, lot 36-40	0-4	F/MW	15000	ND	62	170	ND	7	21	7	190	53000
RS-03*	Blk 21, lot 1	0-4	F/MW										
RS-04	Blk 14, lot 36-40	0-7	F	16000	ND	26	140	ND	10	19	10	170	32000
RS-05	Atl. Cable Sub.	0-2	NS	19000		ND	150	ND	6	21	8	33	25000
RS-05B*	Block 6, lot 39,40	0-5	F										
RS-06	W. of acid plant	0-2	AI	10000	ND	22	150	ND	3	11	9	53	28000
RS-07*	Spill Mine	0-2	NS										
RS-08	Spill Mine	0-2	NS	8600	ND	ND	180	ND	ND	8	ND	21	12000
RS-09*	Acid Mine Drain	0-2	AMD										
RS-10	E. of acid plant	0-2	NS	18000	ND	20	130	ND	3	23	10	54	37000
RS-11*	Block 2 & 4	0-2	NS										
RS-12	Block 12 & 25	0-2	AI/MW	11000	ND	37	100	ND	19	13	8	330	28000
RS-13	Homestake cl.	0-2	S/MW	18000	ND	47	210	ND	20	22	11	860	47000
RS-15	Block 21, lot 1	0-6	F	13,000	ND	21	160	ND	57	21	9	500	38,000
RS-16	Block 2, lots 9-12	0-8	F	15,000	ND	ND	210	ND	6	ND	8	84	33,000
RS-17	Warner K. Patrick	0-2	NS	11,000	ND	ND	140	ND	7	14	6	66	25,000
RS-18	Block 1, lots 16-2	0-5	F	16,000	ND	ND	200	ND	13	20	10	110	36,000
RS-19	RGS Tract	0-2	WL	5,600	ND	28	160	ND	23	10	ND	260	24,000
Soils of the Western U.S.					<1-2.6	<0.1-97	70-500	<1-15	0.01-10	3-2000	0.05-65	2-300	—
Detection Limit				100	20	20	50	2	2	5	5	5	5

ND = not detected at stated Detection Limit      Values in ( ) are milligram/liter TCLP concentrations

\* = sample was not submitted for analysis      Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L

# = from Bowen, 1979, all others from Schacklette & Boerngen 1984

shaded values exceed normal metal range for soils of the Western U.S., or, for Pb, the level where EPA guidance suggests further study.

TABLE 5 TAL CONCENTRATIONS IN SOIL SAMPLES  
(continued)

Sample ID	Location	Depth (in)	Map Unit	Al mg/kg	Sb mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/k	Fe mg/kg
RS-20	Roy Tract	0-2	WL	9,800	ND	22	190	ND	17	17	10	330	51,000
RS-21	Block 20, 21-27	0-2	DS	15,000	ND	ND	86	ND	38	24	11	240	37,000
RS-22	Block 19, 13-20	0-2	DS	12,000	ND	ND	120	ND	33	18	12	200	24,000
RS-23	Block 19, 7-9 & 2	0-2	DA	11,000	ND	29	110	ND	23	19	9	160	29,000
RS-24	Block 28, 6-20	0-2	DS	11,000	ND	30	150	ND	11	18	11	190	38,000
RS-25	Roy Tract	0-2	C/F/A	7,700	ND	40	380	ND	4	15	6	200	63,000
RS-26	E of A.E. Arms Tra	0-6	DD	15,000	ND	27	680	ND	9	37	12	310	61,000
RS-27	E of A.E. Arms Ta	0-2	WL	9,900	ND	25	310	ND	14	15	9	150	26,000
RS-28	Block 25, lot 1-4	0-2	DA	13,000	ND	ND	130	ND	17	21	10	420	37,000
Smuggler	Smug. claim	0-2	NS			12			2.2				
Y.Boy	Y.Boy claim	0-2	NS			19			12				
Hillside #2	H.side #2 claim	0-2	NS			24			16				
Hillside	H.side claim	0-2	NS			26			23				
Home	Home claim	0-2	NS			21			4.6				
S.Patch	S. Patch claim	0-2	NS			26			17				
Ada North	LAda.N. claim	0-2	NS			9.8			ND				
Group	Group tract	0-2	NS			13			2.1				
Soils of the Western US				<1-2.6	<0.1-97	70-500	<1-15	0.01-10	3-2000	0.05-65	2-300	---	
Detection Limit				100	20	20	50	2	2	5	5	5	5

ND = not detected at stated Detection Limit Values in ( ) are milligram/liter TCLP concentrations

\* = sample was not submitted for analysis Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L

# = from Bowen, 1979, all others from Schacklette & Boerngen 1984

shaded values exceed normal metal range for soils of the Western US, or, for Pb, the level where EPA guidance suggests further study.

TABLE 5 TAL CONCENTRATIONS IN SOIL SAMPLES  
(continued)

Sample ID	Location	Depth (in)	Map Unit	Al mg/kg	Sb mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/k	Fe mg/kg
BK10	Block 10	0-2	NS			ND			1.6				
BK11	Block 11	0-2	NS			ND			ND				
BK38	Block 38	0-2	NS			ND			ND				
BK39	Block 39	0-2	NS			14			ND				
Lots 17-20	L 17-20,Blk.1	0-2	F			ND			9.5				
Sch.Lots	L 9-12,Blk.2	0-2	F			ND			6.6				
Patrick	Warner K. Patrick	0-2	NS			10			2.1				
RA-01	Silver Ck	0-4	AI/MW	10000	ND	50	70	ND	10	10	10	190	44000
RP-01	Laura Mine	0-2	MW	5800	ND	74	130	ND	60	6	ND	590	56000
RP-02*	Lex. Mine	0-2	MW										
RP-03	Atl. Cable Mine	0-4	MW	12000	ND	26	90	ND	84	24	13	570	57000
RP-04	Shamrock	0-6	MW			(ND)	(1.1)		(0.66)	(ND)			
T-01	Rico town dump	6	L	19,000	ND	ND	110	2	ND	24	10	9	26,000
T-02	Rico town dump	14	L	10,000	ND	36	140	ND	4	16	8	74	24,000
T-03	Block1 36-38	0-8	F	12,000	ND	49	170	ND	6	25	9	230	47,000
Trench 1	L 40,Blk.1	0-3ft	F/NS			ND			6				
Trench 2	L 40,Blk.1	0-3ft	F/NS			ND			ND				
Soils of the Western US				<1-2.6	<0.1-97	70-500	<1-15	0.01-10	3-2000	0.05-65	2-300	---	
Detection Limit				100	20	20	50	2	2	5	5	5	5

ND = not detected at stated Detection Limit Values in ( ) are milligram/liter TCLP concentrations

\* = sample was not submitted for analysis Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L

# = from Bowen, 1979, all others from Schacklette & Boemgen 1984

shaded values exceed normal metal range for soils of the Western US, or, for Pb, the level where EPA guidance suggests further study.

TABLE 5 TAL CONCENTRATIONS IN SOIL SAMPLES  
(continued)

Sample ID	Location	Depth (in)	Map Unit	Pb mg/kg	Mn mg/kg	Hg mg/kg	Mo mg/kg	Ni mg/kg	Se mg/kg	Ag mg/kg	Ti mg/kg	Ti mg/k	V mg/kg	Zn mg/kg
RS-01	Group Tract	0-2	NS	100	1100	ND	ND	21	ND	ND	ND	330	26	190
RS-02	Blk 1, lot 36-40	0-4	F/MW	1500	1100	2.5	ND	14	ND	112	ND	220	27	990
RS-03*	Blk 21, lot 1	0-4	F/MW											
RS-04	Blk 14, lot 36-40	0-7	F	160	1500	0.8	ND	18	ND	104	ND	270	26	1500
RS-05	Atl. Cable Sub.	0-2	NS	280	1400	ND	ND	16	ND	ND	ND	450	29	880
RS-05B*	Block 6, lot 39,40	0-5	F											
RS-06	W. of acid plant	0-2	AI	90	1100	1.7	ND	14	ND	ND	ND	130	22	200
RS-07*	Spill Mine	0-2	NS											
RS-08	Spill Mine	0-2	NS	140	790	ND	ND	9	ND	ND	ND	140	13	220
RS-09*	Acid Mine Drain	0-2	AMD											
RS-10	E. of acid plant	0-2	NS	160	1100	ND	ND	23	ND	ND	ND	240	26	240
RS-11*	Block 2 & 4	0-2	NS											
RS-12	Block 12 & 25	0-2	AI/MW	5200	1300	ND	ND	13	ND	13	ND	220	21	2400
RS-13	Homestake cl.	0-2	S/MW	4800	5600	0.6	ND	20	ND	64	ND	360	56	4000
RS-15	Block 21, lot 1	0-6	F	3000	3,000	0.5	ND	15	ND	16	ND	210	28	1800
RS-16	Block 2, lots 9-12	0-8	F	760	1800	0.4	ND	13	ND	ND	ND	230	31	1,300
RS-17	Warner K. Patrick	0-2	NS	640	740	ND	ND	10	ND	ND	ND	100	22	750
RS-18	Block 1, 16-20	0-5	F	1400	2,400	0.5	ND	12	ND	ND	ND	230	31	2,400
RS-19	RGS Tract	0-2	WL	12,000	800	0.5	ND	5	ND	21	ND	100	15	3,700
Soils of the Western US				<10-700	30-5000	<0.01-4.	----	<5-700	0.01-12#	0.01-8#	0.02-2.	----	3-500#	10-2100
Detection Limit				20	5	0.2	20	5	20	10	50	5	10	5

ND = not detected at stated Detection Limit Values in ( ) are milligram/liter TCLP concentrations  
 \* = sample was not submitted for analysis Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L  
 # = from Bowen, 1979, all others from Schacklette & Boerngen 1984

shaded values exceed metal range for soils of the Western US, or, for Pb, the level where EPA guidance suggests further study.

TABLE 5 METAL CONCENTRATIONS IN SOIL SAMPLES

(continued)

Sample ID	Location	Depth (in)	Map Unit	Pb mg/kg	Mn mg/kg	Hg mg/kg	Mo mg/kg	Ni mg/kg	Se mg/kg	Ag mg/kg	Tl mg/kg	Ti mg/k	V mg/kg	Zn mg/kg
RS-20	Roy Tract	0-2	WL	2,000	1,800	0.8	ND	14	ND	ND	ND	130	29	2,400
RS-21	Block 20, 21-27	0-2	DS	3,400	2,900	0.3	ND	22	ND	19	ND	150	27	3,300
RS-22	Block 19, 13-20	0-2	DS	2,000	1,500	0.6	ND	12	13	ND	ND	120	24	4,300
RS-23	Block 19, 7-9 & 2	0-2	DA	7,500	2,500	ND	ND	15	ND	ND	ND	190	24	2,000
RS-24	Block 28, lots 6-2	0-2	DS	1,000	1,900	0.4	ND	18	ND	ND	ND	170	25	1,700
RS-25	Roy Tract	0-2	C/F/A	1,200	1,200	ND	ND	11	ND	12	ND	180	28	1,100
RS-26	E of A.E. Arms Tra	0-6	DD	1,000	13,000	0.9	23	25	ND	41	ND	280	29	4,000
RS-27	E of A.E. Arms	0-2	WL	1,500	12,000	ND	ND	17	ND	48	ND	130	22	1,500
RS-28	Block 25, lots 1-4	0-2	DA	8,500	2,000	0.3	ND	14	ND	14	ND	170	28	2,600
Smuggler	Smug. claim	0-2	NS/MW	420										460
Y.Boy	Y.Boy claim	0-2	NS/MW	6,500										2,100
Hillside #2	H.side #2 claim	0-2	NS/MW	9,100										2,100
Hillside	H.side claim	0-2	NS/MW	2,000										3,300
Home	Home claim	0-2	NS/MW	300										780
S.Patch	S. Patch claim	0-2	F/MW	12,000										2,500
Ada North	L Ada N. claim	0-2	NS	77										120
Group	Group tract	0-2	NS	260										500
Soils of the Western US				<10-700	30-5000	<0.01-4	-----	<5-700	0.01-12#	0.01-8#	0.02-2	-----	3-500#	10-2100
Detection Limit				20	5	0.2	20	5	20	10	50	5	10	5

ND = not detected at stated Detection Limit Values in ( ) are milligram/liter TCLP concentrations

\* = sample was not submitted for analysis Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L

# = from Bowen, 1979, all others from Schacklette &amp; Boerngen 1984

shaded values exceed metal range for soils of the Western US, or, for Pb, the level where EPA guidance suggests further study.

TABLE 5  
(continued)

Sample ID	Location	Depth (in)	Map Unit	Pb mg/kg	Mn mg/kg	Hg mg/kg	Mo mg/kg	Ni mg/kg	Se mg/kg	Ag mg/kg	Tl mg/kg	Tl mg/k	V mg/kg	Zn mg/kg
BK10	Block 10	0-2	NS	190										360
BK11	Block 11	0-2	NS	62										150
BK38	Block 38	0-2	NS	84										160
BK39	Block 39	0-2	NS	96										160
Lots 17-20	L.17-20,Blk.1	0-2	F	2,000										2,000
Sch.Lots	L.9-12,Blk.2	0-2	F	1,500										1,500
Patrick	Warner K. Patrick	0-2	NS	9500										970
RA-01	Silver Ck	0-4	AI/MW	180	2300	ND	ND	15	ND	ND	ND	170	15	1,400
RP-01	Laura Mine	0-2	MW	3500	1200	0.4	34	ND	ND	1220	ND	43	12	12,100
RP-02*	Lex. Mine	0-2	MW											
RP-03	Atl. Cable Mine	0-4	MW	2000	5000	0.4	ND	21	ND	630	ND	150	18	15,000
RP-04	Shamrock	0-6	MW	(4.3)		(ND)			(ND)	(ND)				
T-01	Rico town dump	6	L	20	500	ND	ND	24	ND	ND	ND	230	29	65
T-02	Rico town dump	14	L	380	4,300	ND	ND	13	ND	115	ND	200	24	640
T-03	Block 1, 36-38	0-8	F	(21) 7,700	1,200	0.4	ND	16	ND	10	ND	150	28	1,300
Trench 1	L.40,Blk.1	0-3ft.	F/NS	330										1,100
Trench 2	L.40,Blk.1	0-3ft.	F/NS	230										410
Soils of the Western US				<10-700	30-5000	<0.01-4.	-----	<5-700	0.01-12#	0.01-8#	0.02-2.	---	3-500#	10-2100
Detection Limit				20	5	0.2	20	5	20	10	50	5	10	5

ND = not detected at stated Detection Limit Values in ( ) are milligram/liter TCLP concentrations

\* = sample was not submitted for analysis Regulatory level for TCLP: Pb = 5 mg/L, Cd = 1 mg/L, Ba = 100 mg/L

# = from Bowen, 1979, all others from Schacklette & Boerngen 1984

shaded values exceed metal range for soils of the Western US, or, for Pb, the level where EPA guidance suggests further study.

TABLE 6 METAL CONCENTRATIONS IN WATER SAMPLES

Sample ID Location		Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)
RW-01	Silver Ck, below mill	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13
RW-02	Spill Mine	180	ND	ND	ND	ND	0.33	ND	0.13	12	0.39
RW-03	Dolores R. - Arg. Discharg	0.2	ND	ND	ND	ND	ND	ND	ND	ND	0.34
RW-04	Dolores R. down grad.	0.4	ND	ND	ND	ND	ND	ND	ND	ND	0.13
RW-05	Dolores R. up grad.	0.4	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Dolores River Standard				0.05			0.0004	0.1		0.014	1
Detection Limit		0.2	0.2	0.2	0.5	0.02	0.02	0.05	0.05	0.05	0.05

ND = not detected at stated Detection Limit

Sample ID Location		Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	Se (mg/L)	Ag (mg/L)	Tl (mg/L)	Tl (mg/L)	V (mg/L)	Zn (mg/L)
RW-01	Silver Ck, below mill	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	0.22
RW-02	Spill Mine	ND	40	ND	ND	0.39	ND	ND	ND	ND	ND	40
RW-03	Dolores R. - Arg. Discharg	ND	0.76	ND	ND	ND	ND	ND	ND	ND	ND	0.39
RW-04	Dolores R. down grad.	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	0.08
RW-05	Dolores R. up grad.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dolores River Standard		0.004	1	5E-05		0.05	0.02	0.0001				
Detection Limit		0.2	0.05	0.001	0.05	0.05	0.2	0.1	0.2	0.05	0.1	0.05

ND = not detected at stated Detection Limit

***PRIVILEGED AND CONFIDENTIAL***

**TABLE 7    SAMPLING LOCATIONS - ASSAY BUILDING**

<u>Sample Number</u>	<u>Depth (bgs)</u>	<u>Location</u>
SP01	5'	Leach line 10' west of NEC of building
SP02	5'	Leach line 30' west of NEC of building
SP03	8'	Leach line 10' east of NWC of building
SP04	6'	Test pit downgradient of tanks about 6'
SP05	7'	South tank on east side, 3' below top of tank
SP06	5'	Test pit near southwest corner of property
C1	NA	Composite sample from soil stockpile

TABLE 8 - ASSAY BUILDING METAL CONCENTRATIONS IN SOIL SAMPLES

Sample No.	Location	Depth (FT)	Al (mg/kg)	Sb (mg/kg)	As (mg/kg)	Ba (mg/kg)	Be (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Fe (mg/kg)
SP01	10' W NEC	5	16000	ND	ND	210	ND	9	20	9	150	24000
SP02	West Side Mid	5	13000	ND	62	170	ND	13	16	8	190	22000
SP03	NWC Bldg	8	11000	ND	22	98	ND	7	16	9	180	37000
SP04	SEC by tank	6	16000	ND	29	120	ND	5	20	10	40	26000
SP05	Septic tank pit	7	7000	ND	ND	71	ND	7	12	6	160	20000
SP06	SWC-Backgrnd	5	16000	ND	ND	110	ND	3	22	9	45	23000
Soils of Western U.S.				<1-2.6	<0.1-97	70-5000	<1-15	0.01-10	3-2000	0.05-65	2-300	
Detection Level			200	20	20	50	2	2	5	5	5	200

Sample No.	Location	Depth (FT)	Pb (mg/kg)	Mn (mg/kg)	Hg (mg/kg)	Mo (mg/kg)	Ni (mg/kg)	Se (mg/kg)	Ag (mg/kg)	Tl (mg/kg)	Ti (mg/kg)	V (mg/kg)	Zn (mg/kg)
SP01	10' W NEC	5	880	2800	16	ND	15	ND	20	ND	200	27	1800
SP02	West Side Mid	5	1100	8500	1.4	7	12	ND	45	ND	120	22	2100
SP03	NWC Bldg	8	1050	1500	ND	ND	16	ND	ND	ND	120	23	1100
SP04	SEC by tank	6	760	1200	ND	ND	14	ND	ND	ND	240	30	1100
SP05	Septic tank pit	7	1300	1200	ND	ND	9	ND	ND	ND	150	19	1300
SP06	SWC-Backgrnd	5	380	900	ND	ND	16	ND	ND	ND	200	29	630
Soils of Western U.S.			<10-700	30-5000	<0.01-4.6		<5-700	0.01-12#	0.01-8#	0.02-2.8	—	3-500#	10-2100
Detection Level			20	5	0.5	5	5	20	10	50	5	10	5

ND=not detected at stated Detection Level

# From Bowen, 1979

**PRIVILEGED AND CONFIDENTIAL****TABLE 9 FORMER HIGHWAY DEPARTMENT PROPERTY TOXICITY CHARACTERISTIC LEACHING  
PROCEDURE TRACE METAL CONCENTRATIONS**

<b>SAMPLE I.D.</b>	<b>Arsenic</b>	<b>Barium</b>	<b>Cadmium</b>	<b>Chromium</b>	<b>Lead</b>	<b>Mercury</b>	<b>Selenium</b>	<b>Silver</b>
<b>DOT 1</b>	ND	0.8	0.08	ND	ND	ND	ND	ND
<b>DOT 2</b>	ND	1.2	0.05	ND	ND	ND	ND	ND
<b>DOT 3</b>	ND	2	0.07	ND	1.7	ND	ND	ND
<b>Detection Level</b>	0.2	0.5	0.05	0.05	0.5	0.02	.2	0.05
<b>Regulatory Level</b>	5.0	100	1.0	5.0	5.0	0.2	1.0	1.0

ND = not detected

All units are milligrams per liter

**PRIVILEGED AND CONFIDENTIAL****TABLE 10****FORMER HIGHWAY DEPARTMENT PROPERTY -  
AROMATIC VOLATILE COMPOUNDS**

SAMPLE I.D.	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Total Xylenes (mg/kg)		TVH (mg/kg)	TEH (mg/kg)
				m,p- xylene	o-xylene		
DOT 1	ND	ND	ND	ND	ND	14	28
DOT 2	ND	ND	ND	ND	ND	13	ND
DOT 3	ND	1.1	ND	1.3	1.2	810	600
Detection Level	0.2	0.2	0.2	0.2	0.2	10	5

ND = not detected

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX G**  
**LABORATORY ANALYTICAL DATA**

***PRIVILEGED AND CONFIDENTIAL***

**SOIL ANALYTICAL DATA**

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: T-01  
 Project ID: Rico, Colorado  
 Laboratory ID: B947383  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/09/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	19000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	110	50	mg/kg
Beryllium	2	2	mg/kg
Cadmium	ND	2	mg/kg
Chromium	24	5	mg/kg
Cobalt	10	5	mg/kg
Copper	9	5	mg/kg
Iron	26000	100	mg/kg
Lead	20	20	mg/kg
Manganese	500	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	24	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	230	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	65	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	59000	100	mg/kg
Potassium	3400	100	mg/kg
Magnesium	14000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	640	200	mg/kg
Silicon	210	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.



Analyst



Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-02  
Project ID: Rico, Colorado  
Laboratory ID: B947384  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Extracted: 08/16/94  
Date Analyzed: 08/17/94

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,1,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-02  
Laboratory ID: B947384  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Analyzed: 08/17/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-02  
Laboratory ID: B947384  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Analyzed: 08/17/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	107	70 - 121
Toluene-d8	99	81 - 117
Bromofluorobenzene	102	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: **WALSH & ASSOCIATES, INC.**  
 Sample ID: **T-02**  
 Project ID: **Rico, Colorado**  
 Laboratory ID: **B947384**  
 Sample Matrix: **Soil**

Date Reported: **08/30/94**  
 Date Sampled: **08/10/94**  
 Date Received: **08/13/94**  
 Date Extracted: **08/18/94**  
 Date Analyzed: **08/30/94**

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
2,4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: WALSH &amp; ASSOCIATES, INC.

Sample ID: T-02

Date Reported: 08/30/94

Laboratory ID: 8947384

Date Sampled: 08/10/94

Sample Matrix: Soil

Date Analyzed: 08/30/94

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GCMS.

B - Compound detected in Method Blank.

EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES

Client: WALSH &amp; ASSOCIATES, INC.

Sample ID: T-02

Date Reported: 08/30/94

Laboratory ID: 8947384

Date Sampled: 08/10/94

Sample Matrix: Soil

Date Analyzed: 08/30/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.


Unknown concentration calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	69	25 - 121
Phenol-d6	104	24 - 113
Nitrobenzene-d5	77	23 - 120
2-Fluorobiphenyl	86	30 - 115
2,4,6-Tribromophenol	90	19 - 122
Terphenyl-d14	87	18 - 137

## Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: T-02  
 Project ID: Rico, Colorado  
 Laboratory ID: B947384  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/10/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	10000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	36	20	mg/kg
Barium	140	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	4	2	mg/kg
Chromium	16	5	mg/kg
Cobalt	8	5	mg/kg
Copper	74	5	mg/kg
Iron	24000	100	mg/kg
Lead	380	20	mg/kg
Manganese	4300	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	13	5	mg/kg
Selenium	ND	20	mg/kg
Silver	11	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	200	5	mg/kg
Vanadium	24	10	mg/kg
Zinc	640	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	9100	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	8800	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	640	200	mg/kg
Silicon	260	100	mg/kg
Yttrium	ND	50	mg/kg


ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

  
 Analyst

  
 Reviewed

TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
TRACE METAL CONCENTRATION

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-03  
Project ID: Rico, Colorado  
Laboratory ID: B947385  
Sample Matrix: Soil

Date Reported: 08/26/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Extracted TCLP: 08/23/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result (mg/L)	Detection Level (mg/L)	Regulatory Level (mg/L)
Arsenic	ND	0.2	5.0
Barium	0.7	0.5	100
Cadmium	0.08	0.05	1.0
Chromium	ND	0.05	5.0
Lead	21	0.5	5.0
Mercury	ND	0.02	0.2
Selenium	ND	0.2	1.0
Silver	ND	0.05	1.0

ND-Parameter not detected at stated detection level.

## References:

Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively-Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-03  
Project ID: Rico, Colorado  
Laboratory ID: B947385  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	12000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	49	20	mg/kg
Barium	170	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	6	2	mg/kg
Chromium	25	5	mg/kg
Cobalt	9	5	mg/kg
Copper	230	5	mg/kg
Iron	47000	100	mg/kg
Lead	7700	20	mg/kg
Manganese	1200	100	mg/kg
Mercury	0.4	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	16	5	mg/kg
Selenium	ND	20	mg/kg
Silver	10	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	150	5	mg/kg
Vanadium	28	10	mg/kg
Zinc	1300	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	1300	100	mg/kg
Potassium	2100	100	mg/kg
Magnesium	9400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	610	200	mg/kg
Silicon	310	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.

SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission

Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.



Analyst



Reviewed

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
TRACE METAL CONCENTRATION**

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RP-01  
Project ID: Rico, Colorado  
Laboratory ID: B947386  
Sample Matrix: Soil

Date Reported: 08/26/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Extracted TCLP: 08/23/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result (mg/L)	Detection Level (mg/L)	Regulatory Level (mg/L)
Arsenic	ND	0.2	5.0
Barium	1.1	0.5	100
Cadmium	0.66	0.05	1.0
Chromium	ND	0.05	5.0
Lead	4.3	0.5	5.0
Mercury	ND	0.02	0.2
Selenium	ND	0.2	1.0
Silver	ND	0.05	1.0

ND-Parameter not detected at stated detection level.

**References:**

Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.



Analyst



Reviewed

## **QUALITY ASSURANCE / QUALITY CONTROL**

**LAB QA/QC**  
**VOLATILE COMPOUNDS BY GC/MS**  
**METHOD BLANK**

Date Analyzed: 08/17/94  
 Laboratory ID: 3MB-229B  
 Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5	ug/L
Bromomethane	ND	5	ug/L
Vinyl Chloride	ND	5	ug/L
Chloroethane	ND	5	ug/L
Methylene Chloride	ND	20	ug/L
Acetone	ND	20	ug/L
Carbon Disulfide	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethene	ND	5	ug/L
Chloroform	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
2-Butanone	ND	20	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
Cyclohexane	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,4-Dioxane	ND	500	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Dibromochloromethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Benzene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Bromoform	ND	5	ug/L
4-Methyl-2-pentanone	ND	5	ug/L
2-Hexanone	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L

## VOLATILE COMPOUNDS BY GC/MS

Date Analyzed: 08/17/94  
Laboratory ID: 3MB-2298  
Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Toluene	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Ethylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
m,p-Xylene	ND	5	ug/L
o-Xylene	ND	5	ug/L

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

**TENTATIVELY IDENTIFIED COMPOUNDS  
METHOD BLANK ANALYSIS**

Date Analyzed: 08/17/94  
Laboratory ID: 3MB-229B  
Sample Matrix: Water

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recovery	%	Water QC Limits
1,2-Dichloroethane-d4	106	76 - 114
Toluene-d8	100	88 - 110
Bromofluorobenzene	105	86 - 115

**References:**

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**LAB QA/QC**  
**VOLATILE COMPOUNDS BY GC/MS**  
**EXTRACTION BLANK**

Date Analyzed: 08/17/94  
 Laboratory ID: 3EB-229A  
 Sample Matrix: Soil  
 Date Extracted: 8/17/94

Parameter	Analytical Result	Detection Limit	Units
Dichlorodifluoromethane	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Trichlorofluoromethane	ND	0.2	mg/kg
Methylene Chloride	ND	1	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
2,2-Dichloropropane	ND	0.2	mg/kg
cis-1,2-Dichloroethene	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Bromochloromethane	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,1,1-Trichloroethane	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
1,1-Dichloropropene	ND	0.2	mg/kg
Benzene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
Trichloroethene	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Dibromomethane	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
Tetrachloroethene	ND	0.2	mg/kg
1,3-Dichloropropane	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
1,2-Dibromoethane	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
1,1,1,2-Tetrachloroethane	ND	0.2	mg/kg

## VOLATILE COMPOUNDS BY GC/MS

Date Analyzed: 08/17/94  
Laboratory ID: 3EB-229A  
Sample Matrix: Soil  
Date Extracted: 08/17/94

Parameter	Analytical Result	Detection Limit	Units
Ethylbenzene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Isopropylbenzene	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
Bromobenzene	ND	0.2	mg/kg
1,2,3-Trichloropropane	ND	0.2	mg/kg
n-Propylbenzene	ND	0.2	mg/kg
2-Chlorotoluene	ND	0.2	mg/kg
1,3,5-Trimethylbenzene	ND	0.2	mg/kg
4-Chlorotoluene	ND	0.2	mg/kg
tert-Butylbenzene	ND	0.2	mg/kg
1,2,4-Trimethylbenzene	ND	0.2	mg/kg
sec-Butylbenzene	ND	0.2	mg/kg
4-Isopropyltoluene	ND	0.2	mg/kg
1,3-Dichlorobenzene	ND	0.2	mg/kg
1,4-Dichlorobenzene	ND	0.2	mg/kg
n-Butylbenzene	ND	0.2	mg/kg
1,2-Dichlorobenzene	ND	0.2	mg/kg
1,2-Dibromo-3-chloropropane	ND	0.2	mg/kg
1,2,4-Trichlorobenzene	ND	0.2	mg/kg
Hexachlorobutadiene	ND	0.2	mg/kg
Naphthalene	ND	0.2	mg/kg
1,2,3-Trichlorobenzene	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

**TENTATIVELY IDENTIFIED COMPOUNDS  
EXTRACTION BLANK ANALYSIS**

Date Analyzed: 08/17/94  
Laboratory ID: 3EB-229A  
Sample Matrix: Soil  
Date Extracted: 08/17/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recovery	%	Soil QC Limits
Dibromofluoromethane	108	80 - 120
Toluene-d8	101	81 - 117
Bromofluorobenzene	103	74 - 121

**Reference:**

Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst  
Reviewed

LAB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK

Date Analyzed: 08/30/94  
 Laboratory ID: SMB-230  
 Sample Matrix: Soil  
 Date Extracted: 08/18/94

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
1-Methylnaphthalene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
2,4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol *	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
6-Methyl chrysene	ND	1	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	1	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzenethiol	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg

**\_LAB QA/QC**  
**SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS**  
**METHOD BLANK**

Date Analyzed: 08/30/94  
 Laboratory ID: SMB-230  
 Sample Matrix: Soil  
 Date Extracted: 08/18/94

Parameter	Analytical Result	Detection Limit	Units
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	1	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
di-n-Butylphthalate	ND	1	mg/kg
di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)acridine	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indene	ND	1	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg
Pyridine	ND	1	mg/kg
Quinoline	ND	1	mg/kg

ND - Compound not detected at stated Detection Limits.

\* - Compounds Coelute by GC/MS.

LAB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK  
TENTATIVELY IDENTIFIED COMPOUNDS

Date Analyzed: 08/30/94  
Laboratory ID: SMB-230  
Sample Matrix: Soil  
Date Extracted: 08/18/94

Tentatively Identification	Retention Time (min.)	Concentration	Units
-------------------------------	--------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	71	25 - 121
Phenol-d6	99	24 - 113
Nitrobenzene-d5	76	23 - 120
2-Fluorobiphenyl	82	30 - 115
2,4,6-Tribromophenol	85	19 - 122
Terphenyl-d14	77	18 - 137

Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for  
Semivolatile Organics, Test Methods for Evaluating Solid Wastes,  
SW846, USEPA, Third Edition, November 1986.

USEPA Contract Lab Program, Statement of Work for Organic  
Analysis, Multi-Media, Multi-Concentration, OLM01.0, December 1990.

  
Analyst

  
Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
METHOD BLANK

Date Analyzed: 08/25/94  
Laboratory ID: TMB 94-30  
Sample Matrix: Extract

Parameter	Sample Result	PQL	Regulatory Level	Units
Arsenic	ND	0.2	5.0	mg/L
Barium	ND	5	100.0	mg/L
Cadmium	ND	0.05	1.0	mg/L
Chromium	ND	0.05	5.0	mg/L
Lead	ND	0.2	5.0	mg/L
Mercury	ND	0.02	0.2	mg/L
Selenium	ND	0.2	1.0	mg/L
Silver	ND	0.05	1.0	mg/L

ND-Parameter not detected at stated detection level.


## References:

Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
PURGEABLE ORGANIC COMPOUNDS  
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 08/17/94  
Laboratory ID: 3MSD7281  
Sample Matrix: Water

## ORIGINAL SAMPLE PARAMETERS

Parameter	Spike Added (ug/L)	Sample Conc. (ug/L)	MS Conc. (ug/L)	MS Recovery (%)	QC Limits (% Rec.)
1,1-Dichloroethene	100	0	100	100	61-145
Trichloroethene	100	0	100	100	71-120
Benzene	100	0	97	97	76-127
Toluene	100	0	93	93	71-127
Chlorobenzene	100	0	94	94	75-130

## DUPLICATE SAMPLE PARAMETERS

Parameter	Spike Added (ug/L)	MSD Conc. (ug/L)	MSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
1,1-Dichloroethene	100	104	104	4	14	61-145
Trichloroethene	100	98	98	2	14	71-120
Benzene	100	95	95	2	11	76-127
Toluene	100	91	91	2	13	71-127
Chlorobenzene	100	92	92	2	13	75-130

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.

Analyst

Reviewed

**LAB QA/QC  
PURGEABLE ORGANIC COMPOUNDS  
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY**

Date Analyzed: 08/17/94  
Laboratory ID: 3EMSD738  
Sample Matrix: Soil  
Date Extracted: 8/17/94


**ORIGINAL SAMPLE PARAMETERS**


Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	MS Conc. (mg/kg)	MS Recovery (%)	QC Limits (% Rec.)
1,1-Dichloroethene	2	0	1.5	71	59-172
Trichloroethene	2	0	1.5	75	62-137
Benzene	2	0	1.6	80	66-142
Toluene	2	0	1.5	71	59-139
Chlorobenzene	2	0	1.6	80	60-133

**DUPLICATE SAMPLE PARAMETERS**

Parameter	Spike Added (mg/kg)	MSD Conc. (mg/kg)	MSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
1,1-Dichloroethene	2	1.6	76	7	22	59-172
Trichloroethene	2	1.7	85	13	24	62-137
Benzene	2	1.7	85	11	21	66-142
Toluene	2	1.7	81	13	21	59-139
Chlorobenzene	2	1.7	85	6	21	60-133

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.

  
Analyst

  
Reviewed

AB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
BLANK SPIKE

Date Analyzed: 08/30/94  
Laboratory ID: SBS-230  
Sample Matrix: Soil  
Date Extracted: 08/18/94


Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	MS Conc. (mg/kg)	MS Recovery (%)	QC Limits (% Rec.)
Phenol	200	0	124	125	26 - 90
2-Chlorophenol	200	0	120	123	25 - 102
1,4-Dichlorobenzene	100	0	71	73	28 - 104
n-Nitroso-di-n-propylamine	100	0	80	76	41-126
1,2,4-Trichlorobenzene	100	0	74	82	38 - 107
4-Chloro-3-methylphenol	200	0	119	136	26 - 103
Acenaphthene	100	0	70	83	31 - 137
4-Nitrophenol	200	0	120	154	11-114
4-Dinitrotoluene	100	0	71	84	28 - 89
Pentachlorophenol	200	0	187	155	17 - 109
Pyrene	100	0	77	75	35 - 142

QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	81	25 - 121
Phenol-d6	101	24 - 113
Nitrobenzene-d5	79	23 - 120
2-Fluorobiphenyl	84	30 - 115
2,4,6-Tribromophenol	92	19 - 122
Terphenyl-d14	82	18 - 137

Spike Recovery: 0 out of 11 outside QC limits.

  
Analyst

  
Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
MATRIX SPIKE

Date Analyzed: 08/25/94  
Laboratory ID: B947386  
Sample Matrix: Soil

Parameter	Spike Added (mg/L)	Sample Conc. (mg/L)	MS Conc. (mg/L)	MS Recovery (%)	QC Limits (% Rec.)
Arsenic	2.5	ND	2.6	105	75 - 125
Barium	5.0	1.1	6.0	97	75 - 125
Cadmium	0.50	0.66	1.12	92	75 - 125
Chromium	2.0	ND	2.0	98	75 - 125
Lead	2.0	4.3	6.1	91	75 - 125
Mercury	0.20	ND	0.21	103	75 - 125
Selenium	2.5	ND	2.9	114	75 - 125
Silver	0.05	ND	0.06	121	75 - 125

ND-Parameter not detected at stated detection level.

## References:


Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
DUPLICATE SUMMARY

Date Analyzed: 08/25/94  
Laboratory ID: B947385  
Sample Matrix: Soil

Parameter	Sample Result	Duplicate Sample Result	RPD %	PQL	Units
Arsenic	ND	ND	0	0.2	mg/L
Barium	0.7	0.7	0	5	mg/L
Cadmium	0.08	0.08	0	0.05	mg/L
Chromium	ND	ND	0	0.05	mg/L
Lead	21	22	5	0.2	mg/L
Mercury	ND	ND	0	0.02	mg/L
Selenium	ND	ND	0	0.2	mg/L
Silver	ND	ND	0	0.05	mg/L

ND-Parameter not detected at stated detection level.


## References:


Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed



## CHAIN OF CUSTODY RECORD

Client/Project Name		Project Location		ANALYSES / PARAMETERS							
Sampler: (Signature)		Chain of Custody Tape No.								Remarks	
Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	Metal Screen ICP					
RS-15	8/9	11:30	B947369	soil	1	✓					1-20g ea.
RS-16	8/9	10:40	7370	soil	1	✓					
RS-17	8/9	12:10	7371	soil	1	✓					
RS-18	8/9	16:50	7372	soil	1	✓					
RS-19	8/10	8:20	7373	soil	1	✓					
RS-20	8/10	8:50	7374	soil	1	✓					
RS-21	8/10	13:15	7375	soil	1	✓					
RS-22	8/10	13:30	7376	soil	1	✓					
RS-23	8/10	13:45	7377	soil	1	✓					16.0°C (water)
RS-24	8/10	14:15	7378	soil	1	✓					
RS-25	8/10	16:00	7379	soil	1	✓					
RS-26	8/10	16:30	7380	soil	1	✓					
RS-27	8/10	17:00	7381	soil	1	✓					
RS-28	8/10	17:15	7382	soil	1	✓					
Relinquished by: (Signature)				Date	Time	Received by: (Signature)				Date	Time
David P. Brasher				8/12/94		David P. Brasher				8/13/94	9:50
Relinquished by: (Signature)				Date	Time	Received by: (Signature)				Date	Time
Relinquished by: (Signature)				Date	Time	Received by laboratory: (Signature)				Date	Time
Inter-Mountain Laboratories, Inc.											19659
<div><input type="checkbox"/> 1633 Terra Avenue Sheridan, Wyoming 82801 Telephone (307) 872-8945</div> <div><input type="checkbox"/> 1714 Phillips Circle Gilets, Wyoming 82716 Telephone (307) 882-8945</div> <div><input type="checkbox"/> 2506 West Main Street Farmington, NM 87401 Telephone (505) 326-4737</div> <div><input type="checkbox"/> 1160 Research Dr. Bozeman, Montana 59715 Telephone (406) 586-6450</div> <div><input type="checkbox"/> 11183 SH 30 College Station, TX 77845 Telephone (409) 776-8945</div> <div><input type="checkbox"/> 3304 Longmire Drive College Station, TX 77845 Telephone (409) 774-4999</div>											



## CHAIN OF CUSTODY RECORD

Client/Project Name		Project Location		ANALYSES / PARAMETERS						
Sampler: (Signature)		Chain of Custody Tape No.							Remarks	
Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	Metals Screen ICP	VOAs	Semi-VOAs	TCUP Metals	
T-01	8/9	13:20	7383	Soil	1		✓			
T-01	8/9	13:21	7384	Soil	1			✓		
T-01	8/9	13:22		Soil	1	✓				
T-02	8/10	10:00	7384	Soil	1		✓			
T-02	8/10	10:01		Soil	1			✓		
T-02	8/10	10:02		Soil	✓	✓				
T-03	8/9	14:10	7385	Soil	1				✓	
T-03	8/9	14:15		Soil	1	✓				
RP-01	8/10	15:30	7386	Soil	1				✓	Label has ID on RP-04
Relinquished by: (Signature)					Date	Time	Received by: (Signature)		Date	Time
David P. Bunch					8/12/94		F. E. Carrier			
Relinquished by: (Signature)					Date	Time	Received by: (Signature)		Date	Time
F. E. Carrier							I M L (Bozeman)		8/13/94	1950
Relinquished by: (Signature)					Date	Time	Received by laboratory: (Signature)		Date	Time

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue  
Sheridan, Wyoming 82801  
Telephone (307) 672-8945

☐ 1714 Phillips Circle  
Gillette, Wyoming 82716  
Telephone (307) 682-8945

☐ 2506 West Main Street  
Farmington, NM 87401  
Telephone (505) 328-4737

☐ 1160 Research Dr.  
Bozeman, Montana 59715  
Telephone (406) 588-8450

☐ 11183 SH 30  
College Station, TX 77845  
Telephone (409) 778-8945

☐ 3304 Longmire Drive  
College Station, TX 77845  
Telephone (409) 774-4999

19660

## CASE NARRATIVE

On September 8, 1994, seventeen samples were received for analysis at InterMountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for arsenic, cadmium, lead, and zinc. Client name/Project name was listed as Walsh & Associates / Rico.

Detectable amounts of targeted compounds were present in some of the samples.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

  
Wynn Sudtelgte  
IML-Bozeman

0920wa

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Smuggler  
Project ID: #1897-040 / Rico  
Laboratory ID: B948075  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94


Parameter	Analytical Result	Detection Level	Units *
Arsenic	12	10	mg/kg
Cadmium	2.2	1	mg/kg
Lead	420	10	mg/kg
Zinc	460	3	mg/kg


\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Yankee Bay  
Project ID: #1897-040 / Rico  
Laboratory ID: B948076  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94


Parameter	Analytical Result	Detection Level	Units *
Arsenic	19	10	mg/kg
Cadmium	12	1	mg/kg
Lead	6500	10	mg/kg
Zinc	2100	3	mg/kg

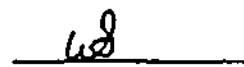
\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Hillside #2  
Project ID: #1897-040 / Rico  
Laboratory ID: B948077  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94


Parameter	Analytical Result	Detection Level	Units *
Arsenic	24	10	mg/kg
Cadmium	16	1	mg/kg
Lead	9100	10	mg/kg
Zinc	2400	3	mg/kg


\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Hillside  
Project ID: #1897-040 / Rico  
Laboratory ID: B948078  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	26	10	mg/kg
Cadmium	23	1	mg/kg
Lead	2800	10	mg/kg
Zinc	3400	3	mg/kg


\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Home  
Project ID: #1897-040 / Rico  
Laboratory ID: B948079  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	21	10	mg/kg
Cadmium	4.6	1	mg/kg
Lead	300	10	mg/kg
Zinc	780	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Sam Patch  
Project ID: #1897-040 / Rico  
Laboratory ID: B948080  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	26	10	mg/kg
Cadmium	17	1	mg/kg
Lead	12000	10	mg/kg
Zinc	2900	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Patrick  
Project ID: #1897-040 / Rico  
Laboratory ID: B948081  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	10	10	mg/kg
Cadmium	2.1	1	mg/kg
Lead	9300	10	mg/kg
Zinc	970	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Ada North  
Project ID: #1897-040 / Rico  
Laboratory ID: B948082  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	9.8	10	mg/kg
Cadmium	ND	1	mg/kg
Lead	77	10	mg/kg
Zinc	120	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Group Tract  
Project ID: #1897-040 / Rico  
Laboratory ID: B948083  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	13	10	mg/kg
Cadmium	2.1	1	mg/kg
Lead	260	10	mg/kg
Zinc	500	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Trench 1  
Project ID: #1897-040 / Rico  
Laboratory ID: B948084  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	6	1	mg/kg
Lead	830	10	mg/kg
Zinc	1400	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Trench 2  
Project ID: #1897-040 / Rico  
Laboratory ID: B948085  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	ND	1	mg/kg
Lead	230	10	mg/kg
Zinc	410	3	mg/kg


\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: BK 10  
Project ID: #1897-040 / Rico  
Laboratory ID: B948086  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94


Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	1.6	1	mg/kg
Lead	190	10	mg/kg
Zinc	360	3	mg/kg


\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: BK 11  
Project ID: #1897-040 / Rico  
Laboratory ID: B948087  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94


Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	ND	1	mg/kg
Lead	62	10	mg/kg
Zinc	150	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: BK 38  
Project ID: #1897-040 / Rico  
Laboratory ID: B948088  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	ND	1	mg/kg
Lead	84	10	mg/kg
Zinc	160	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: BK 39  
Project ID: #1897-040 / Rico  
Laboratory ID: B948089  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	14	10	mg/kg
Cadmium	ND	1	mg/kg
Lead	96	10	mg/kg
Zinc	160	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.



Analyst



Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: Lots 17-20  
Project ID: #1897-040 / Rico  
Laboratory ID: B948090  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	9.5	1	mg/kg
Lead	830	10	mg/kg
Zinc	2000	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.



Analyst



Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: School Lots  
Project ID: #1897-040 / Rico  
Laboratory ID: B948091  
Sample Matrix: Soil

Date Reported: 09/09/94  
Date Sampled: 09/07/94  
Date Received: 09/08/94  
Date Digested: 09/08/94  
Date Analyzed: 09/09/94

Parameter	Analytical Result	Detection Level	Units *
Arsenic	ND	10	mg/kg
Cadmium	6.6	1	mg/kg
Lead	650	10	mg/kg
Zinc	1500	3	mg/kg

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
Analyst

  
Reviewed

## **QUALITY ASSURANCE / QUALITY CONTROL**

LAB QA/QC  
TOTAL METALS ANALYSIS  
MATRIX SPIKE

Date Analyzed: 09/08/94  
Laboratory ID: B948083  
Sample Matrix: Soil

Parameter	Spike Added (mg/L)	Sample Conc. (mg/L)	MS Conc. (mg/L)	MS Recovery (%)	QC Limits (% Rec.)
Arsenic	2.5	0.57	2.7	85	75 - 125
Cadmium	0.50	0.04	0.49	91	75 - 125
Lead	1.5	5.2	6.6	95	75 - 125
Zinc	1.0	10.2	11.2	106	75 - 125

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
TOTAL METALS ANALYSIS  
DUPLICATE ANALYSIS

Date Analyzed: 09/08/94  
Laboratory ID: B948083  
Sample Matrix: Soil

Parameter	Analytical Result (mg/kg)	Duplicate Result (mg/kg)	Percent RPD ( % )	QC Limits ( % )
Arsenic	13	14	7	25
Cadmium	2.1	2.6	21	25
Lead	260	300	14	25
Zinc	500	550	10	25

\* Results are reported on an as received basis (wet wt. mg/kg).  
ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

Proj. No.		Project Name		TO: Deb Andrus										No. of Containers	Remarks		
1897-040		RICO															
SAMPLERS: (Signature)																	
[Signature]																	
Sta No	Date	Time	Station Location	Sample Tag No.	As	Col	Pb	Ba									
8015	9/1/94	1030	Smuggler	39321	/												1-4oz ea.
8016	9/1/94	1115	Yankee Boy	39322	/												
8017	9/1/94	1102	Hillside #2	39323	/												
8018	9/1/94	1115	Hillside	39324	/												
8019	9/1/94	1125	Home	39325	/												
8060	9/1/94	1140	Sam Patch	39326	/												
8061	9/1/94	1225	Patrice	39327	/												
8062	9/1/94	1310	Ada Nath	39328	/												
8063	9/1/94	1320	Group tract	39329	/												
8084	9/1/94	14:29	Trench 1	39330, 39340	/												2-4oz
8065	9/1/94	14:43	Trench 2	39331, 39341	/												"
8066	9/1/94	1505	Front 3 BK 10	39332-39335	/												2-2oz
8087	9/1/94	15:20	BK 11	39336-39339	/												"
8088	9/1/94	15:21	BK 38	39338	/												
8089	9/1/94	15:25	BK 39	39339	/												
Relinquished by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)	
[Signature]		17:25 9/7		Fred A		9/8/94		94022		[Signature]		[Signature]		[Signature]		[Signature]	
Relinquished by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)		Date/Time		Received by: (Sign.)	
Relinquished by: (Sign.)		Date/Time		Received for Laboratory by: (Sign.)		Date/Time		Remarks: "cooler" temp. 20.1 (frozen/blue ice)									

## **CASE NARRATIVE**

On June 18, 1994, twelve soil samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for ICP scan for metals and mercury. Client name/Project name was listed as Walsh & Associates / 1897-010 / Rico Co.

Detectable amounts of targeted compounds were present in all of the samples.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

  
Wynn Sudtelgte  
IML-Bozeman

0714wa2

GENERAL PARAMETERS  
PERCENT SOLIDS

Client: WALSH & ASSOCIATES  
Sample ID: Inclusive  
Project ID: 1897-010 / Rico Co  
Laboratory ID: B945766-5777  
Sample Matrix: Soil  
Preservation: cool  
Condition: intact

Date Reported: 07/14/94  
Date Sampled: 06/13/94  
Date Received: 06/18/94

Sample ID	Lab ID	Analytical Result	Units
RS-01	B945766	91	%
RS-02	B945767	95	%
RS-04	B945768	95	%
RS-05	B945769	97	%
RS-06	B945770	97	%
RS-08	B945771	84	%
IS-10	B945772	97	%
RS-12	B945773	98	%
RS-13	B945774	98	%
RP-01	B945775	98	%
RP-03	B945776	88	%
RA-01	B945777	96	%

Reference: Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-01  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945766  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	17000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	110	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	ND	2	mg/kg
Chromium	19	5	mg/kg
Cobalt	10	5	mg/kg
Copper	27	5	mg/kg
Iron	23000	100	mg/kg
Lead	100	20	mg/kg
Manganese	1100	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	21	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	330	5	mg/kg
Vanadium	26	10	mg/kg
Zinc	190	5	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	6000	100	mg/kg
Potassium	3000	100	mg/kg
Magnesium	11000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	9500	200	mg/kg
Silicon	450	100	mg/kg
Yttrium	ND	50	mg/kg

ND- Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SR  
 Analyst

WS  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-02  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945767  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	15000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	62	20	mg/kg
Barium	170	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	7	2	mg/kg
Chromium	21	5	mg/kg
Cobalt	7	5	mg/kg
Copper	190	5	mg/kg
Iron	53000	100	mg/kg
Lead	1500	20	mg/kg
Manganese	1100	100	mg/kg
Mercury	2.5	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	14	5	mg/kg
Selenium	ND	20	mg/kg
Silver	11	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	220	5	mg/kg
Vanadium	27	10	mg/kg
Zinc	990	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	1300	100	mg/kg
Potassium	2200	100	mg/kg
Magnesium	10000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	1300	200	mg/kg
Silicon	560	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SR  
 Analyst

us  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-04  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: 8945768  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	16000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	26	20	mg/kg
Barium	140	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	10	2	mg/kg
Chromium	19	5	mg/kg
Cobalt	10	5	mg/kg
Copper	170	5	mg/kg
Iron	32000	100	mg/kg
Lead	160	20	mg/kg
Manganese	1500	100	mg/kg
Mercury	0.8	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	18	5	mg/kg
Selenium	ND	20	mg/kg
Silver	10	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	270	5	mg/kg
Vanadium	26	10	mg/kg
Zinc	1500	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	5500	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	8700	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	1000	200	mg/kg
Silicon	730	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 Technique), SW-846, September 1986.

SE  
 Analyst

WB  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-05  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945769  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	19000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	150	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	6	2	mg/kg
Chromium	21	5	mg/kg
Cobalt	8	5	mg/kg
Copper	33	5	mg/kg
Iron	25000	100	mg/kg
Lead	280	20	mg/kg
Manganese	1400	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	16	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	450	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	880	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	4600	100	mg/kg
Potassium	2900	100	mg/kg
Magnesium	7000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	670	200	mg/kg
Silicon	560	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SE

Analyst

LD

Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-06  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945770  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	10000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	22	20	mg/kg
Barium	150	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	3	2	mg/kg
Chromium	11	5	mg/kg
Cobalt	9	5	mg/kg
Copper	53	5	mg/kg
Iron	28000	100	mg/kg
Lead	90	20	mg/kg
Manganese	1100	100	mg/kg
Mercury	1.7	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	14	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	130	5	mg/kg
Vanadium	22	10	mg/kg
Zinc	200	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	4300	100	mg/kg
Potassium	2100	100	mg/kg
Magnesium	4400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	840	200	mg/kg
Silicon	730	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 Technique), SW-846, September 1986.

SR  
 Analyst

LD  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH &amp; ASSOCIATES

Sample ID: RS-08

Project ID: 1897-010 / Rico Co

Laboratory ID: B945771

Sample Matrix: Soil

Preservation: Cool

Condition: Intact

Date Reported: 07/12/94

Date Sampled: 06/13/94

Date Received: 06/18/94

Date Extracted: 07/05/94

Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	8600	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	180	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	ND	2	mg/kg
Chromium	8	5	mg/kg
Cobalt	ND	5	mg/kg
Copper	21	5	mg/kg
Iron	12000	100	mg/kg
Lead	140	20	mg/kg
Manganese	790	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	9	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	140	5	mg/kg
Vanadium	13	10	mg/kg
Zinc	220	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	8500	100	mg/kg
Potassium	2000	100	mg/kg
Magnesium	3300	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	670	200	mg/kg
Silicon	730	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.SE  
Analystus  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-10  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945772  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	18000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	20	20	mg/kg
Barium	130	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	3	2	mg/kg
Chromium	23	5	mg/kg
Cobalt	10	5	mg/kg
Copper	54	5	mg/kg
Iron	37000	100	mg/kg
Lead	160	20	mg/kg
Manganese	1100	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	23	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	240	5	mg/kg
Vanadium	26	10	mg/kg
Zinc	240	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	3700	100	mg/kg
Potassium	3200	100	mg/kg
Magnesium	11000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	1000	200	mg/kg
Silicon	500	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 Technique), SW-846, September 1986.

SE  
 Analyst

LS  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-12  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945773  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	11000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	37	20	mg/kg
Barium	100	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	19	2	mg/kg
Chromium	13	5	mg/kg
Cobalt	8	5	mg/kg
Copper	330	5	mg/kg
Iron	28000	100	mg/kg
Lead	5200	20	mg/kg
Manganese	1300	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	13	5	mg/kg
Selenium	ND	20	mg/kg
Silver	13	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	220	5	mg/kg
Vanadium	21	10	mg/kg
Zinc	2400	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	3700	100	mg/kg
Potassium	1500	100	mg/kg
Magnesium	5800	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	790	200	mg/kg
Silicon	410	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SE  
 Analyst

WJ  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RS-13  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945774  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	18000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	47	20	mg/kg
Barium	210	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	20	2	mg/kg
Chromium	22	5	mg/kg
Cobalt	11	5	mg/kg
Copper	660	5	mg/kg
Iron	47000	100	mg/kg
Lead	4800	20	mg/kg
Manganese	5600	100	mg/kg
Mercury	0.6	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	20	5	mg/kg
Selenium	ND	20	mg/kg
Silver	64	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	360	5	mg/kg
Vanadium	56	10	mg/kg
Zinc	4000	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	12000	100	mg/kg
Potassium	2900	100	mg/kg
Magnesium	8700	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	8200	200	mg/kg
Silicon	630	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SP  
 Analyst

WS  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RP-01  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945775  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/13/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	5800	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	74	20	mg/kg
Barium	130	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	60	2	mg/kg
Chromium	6	5	mg/kg
Cobalt	ND	5	mg/kg
Copper	590	5	mg/kg
Iron	56000	100	mg/kg
Lead	8500	20	mg/kg
Manganese	1200	100	mg/kg
Mercury	0.4	0.2	mg/kg
Molybdenum	34	20	mg/kg
Nickel	ND	5	mg/kg
Selenium	ND	20	mg/kg
Silver	220	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	43	5	mg/kg
Vanadium	12	10	mg/kg
Zinc	9000	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	3100	100	mg/kg
Potassium	1800	100	mg/kg
Magnesium	4100	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	720	200	mg/kg
Silicon	240	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

SJZ  
 Analyst

LJD  
 Reviewed

## TOTAL METALS ANALYSIS

Client:	WALSH & ASSOCIATES	Date Reported:	07/12/94
Sample ID:	RP-03	Date Sampled:	06/13/94
Project ID:	1897-010 / Rico Co	Date Received:	06/18/94
Laboratory ID:	B945776	Date Extracted :	07/05/94
Sample Matrix:	Soil	Date Analyzed:	07/06/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Level	Units
Aluminum	12000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	26	20	mg/kg
Barium	90	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	84	2	mg/kg
Chromium	24	5	mg/kg
Cobalt	13	5	mg/kg
Copper	570	5	mg/kg
Iron	57000	5	mg/kg
Lead	7000	20	mg/kg
Manganese	5000	5	mg/kg
Mercury	0.4	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	21	5	mg/kg
Selenium	ND	20	mg/kg
Silver	68	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	150	5	mg/kg
Vanadium	18	10	mg/kg
Zinc	13000	5	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	25000	100	mg/kg
Potassium	1300	100	mg/kg
Magnesium	11000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	520	200	mg/kg
Silicon	580	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.

SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission

Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.SP  
AnalystLS  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH &amp; ASSOCIATES

Sample ID: RA-01

Project ID: 1897-010 / Rico Co

Laboratory ID: B945777

Sample Matrix: Soil

Preservation: Cool

Condition: Intact

Date Reported: 07/12/94

Date Sampled: 06/13/94

Date Received: 06/18/94

Date Extracted: 07/05/94

Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	10000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	50	20	mg/kg
Barium	70	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	10	2	mg/kg
Chromium	10	5	mg/kg
Cobalt	10	5	mg/kg
Copper	190	5	mg/kg
Iron	44000	5	mg/kg
Lead	180	20	mg/kg
Manganese	2300	5	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	15	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	170	5	mg/kg
Vanadium	15	10	mg/kg
Zinc	1400	5	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	8800	100	mg/kg
Potassium	1600	100	mg/kg
Magnesium	7400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	660	200	mg/kg
Silicon	380	100	mg/kg
Yttrium	ND	50	mg/kg

ND-Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.

SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission

Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.SR  
Analystweb  
Reviewed

# CHAIN OF CUSTODY RECORD

Client/Project Name		Project Location		ANALYSES / PARAMETERS					
Walsh Environmental/1897-010		Rico CO							
Sampler: (Signature)		Chain of Custody Tape No.		Remarks					
[Signature]									
Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers				
RS-01 (Jan 10)	6/13/94		B945766	Soil	1				1-20g. ea.
RS-02 (Jan 15)			5767		1				
RS-04 (Jan 11)			5768		1				
RS-05 (Jan 8)			5769		1				
RS-06 (Jan 9)			5770	-	1				
RS-08 (Jan 5)			5771		1				
RS-10 (Jan 1)			5772		1				
RS-12 (Jan 2)			5773		1				
RS-13 (Jan 4)			5774		1				
RP-01 (Jan 14)			5775		1				
RP-03 (Jan 17)			5776		1				
RA-01 (Jan 12)	↓		5777	↓	1				
Relinquished by: (Signature)		Date	Time	Received by: (Signature)		Date	Time		
[Signature]		6/18/94	1545	Fed Ex. carrier)					
Relinquished by: (Signature)		Date	Time	Received by: (Signature)		Date	Time		
Fed Ex. carrier)				I ML via Fed Ex.		6/18/94	1030 AM		
Relinquished by: (Signature)		Date	Time	Received by laboratory: (Signature)		Date	Time		
Inter-Mountain Laboratories, Inc.									
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> 1633 Terra Avenue Sheridan, Wyoming 82801 Telephone (307) 672-8945         </div> <div> <input type="checkbox"/> 1714 Phillips Circle Gillette, Wyoming 82718 Telephone (307) 682-8945         </div> <div> <input type="checkbox"/> 2506 West Main Street Farmington, NM 87401 Telephone (505) 326-4737         </div> <div> <input checked="" type="checkbox"/> 1160 Research Dr. Bozeman, Montana 59715 Telephone (406) 588-8450         </div> <div> <input type="checkbox"/> 11183 SH 30 College Station, TX 77845 Telephone (409) 776-8945         </div> <div> <input type="checkbox"/> 3304 Longmire Drive College Station, TX 77845 Telephone (409) 774-4999         </div> </div>									
22132									


### **CASE NARRATIVE**

On August 13, 1994, eighteen samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for Toxicity Characteristic Leaching Procedure Parameters, metals only, volatile organic compounds, semivolatile organic compounds, and ICP metals scans. Client name / Project name was listed as Walsh Environmental / Rico / Rico, CO.

Detectable amounts of targeted compounds were present in the samples. Sample T-03 was above the regulatory limit for lead in a TCLP.

The Toxicity Characteristic Leaching Procedure methodology used is outlined in the Federal Register, 40 CFR 261, Vol. 55, No. 126, June 29, 1990. Results are reported in mass per unit volume of leachate (mg/L).

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

  
Wynn Sudtelgte  
IML-Bozeman

0830wa

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-15  
Project ID: Rico, Colorado  
Laboratory ID: B947369  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	13000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	21	20	mg/kg
Barium	160	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	57	2	mg/kg
Chromium	21	5	mg/kg
Cobalt	9	5	mg/kg
Copper	500	5	mg/kg
Iron	38000	100	mg/kg
Lead	3900	20	mg/kg
Manganese	3000	100	mg/kg
*Mercury	0.5	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	15	5	mg/kg
Selenium	ND	20	mg/kg
Silver	16	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	210	5	mg/kg
Vanadium	28	10	mg/kg
Zinc	7700	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	12000	100	mg/kg
Potassium	2100	100	mg/kg
Magnesium	8400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	620	200	mg/kg
Silicon	870	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: RS-16  
 Project ID: Rico, Colorado  
 Laboratory ID: 8947370  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/09/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	15000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	210	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	6	2	mg/kg
Chromium	ND	5	mg/kg
Cobalt	8	5	mg/kg
Copper	84	5	mg/kg
Iron	33000	100	mg/kg
Lead	750	20	mg/kg
Manganese	1800	100	mg/kg
Mercury	0.4	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	13	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	230	5	mg/kg
Vanadium	31	10	mg/kg
Zinc	1300	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	4800	100	mg/kg
Potassium	2900	100	mg/kg
Magnesium	6300	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	900	200	mg/kg
Silicon	390	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.

SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission

Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

  
 Analyst

  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-17  
Project ID: Rico, Colorado  
Laboratory ID: B947371  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	11000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	140	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	7	2	mg/kg
Chromium	14	5	mg/kg
Cobalt	6	5	mg/kg
Copper	66	5	mg/kg
Iron	25000	100	mg/kg
Lead	540	20	mg/kg
Manganese	740	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	10	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	100	5	mg/kg
Vanadium	22	10	mg/kg
Zinc	750	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	5800	100	mg/kg
Potassium	1900	100	mg/kg
Magnesium	4900	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	580	200	mg/kg
Silicon	220	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-18  
Project ID: Rico, Colorado  
Laboratory ID: B947372  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	16000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	200	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	13	2	mg/kg
Chromium	20	5	mg/kg
Cobalt	10	5	mg/kg
Copper	110	5	mg/kg
Iron	36000	100	mg/kg
Lead	1400	20	mg/kg
Manganese	2400	100	mg/kg
Mercury	0.5	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	12	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	230	5	mg/kg
Vanadium	31	10	mg/kg
Zinc	2400	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	11000	100	mg/kg
Potassium	2900	100	mg/kg
Magnesium	9400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	660	200	mg/kg
Silicon	950	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: RS-19  
 Project ID: Rico, Colorado  
 Laboratory ID: B947373  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/10/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	5600	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	28	20	mg/kg
Barium	160	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	23	2	mg/kg
Chromium	10	5	mg/kg
Cobalt	ND	5	mg/kg
Copper	260	5	mg/kg
Iron	24000	100	mg/kg
Lead	12000	20	mg/kg
Manganese	800	100	mg/kg
Mercury	0.5	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	5	5	mg/kg
Selenium	ND	20	mg/kg
Silver	21	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	100	5	mg/kg
Vanadium	15	10	mg/kg
Zinc	3700	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	5800	100	mg/kg
Potassium	1900	100	mg/kg
Magnesium	3100	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	320	200	mg/kg
Silicon	420	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.



Analyst



Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: RS-20  
 Project ID: Rico, Colorado  
 Laboratory ID: B947374  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/10/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	9800	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	22	20	mg/kg
Barium	190	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	17	2	mg/kg
Chromium	17	5	mg/kg
Cobalt	10	5	mg/kg
Copper	330	5	mg/kg
Iron	51000	100	mg/kg
Lead	2000	20	mg/kg
Manganese	1800	100	mg/kg
Mercury	0.8	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	14	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	130	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	2400	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	3800	100	mg/kg
Potassium	2000	100	mg/kg
Magnesium	4200	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	840	200	mg/kg
Silicon	430	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

  
 Analyst

  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-21  
Project ID: Rico, Colorado  
Laboratory ID: B947375  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	15000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	86	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	38	2	mg/kg
Chromium	24	5	mg/kg
Cobalt	11	5	mg/kg
Copper	240	5	mg/kg
Iron	37000	100	mg/kg
Lead	3400	20	mg/kg
Manganese	2900	100	mg/kg
Mercury	0.3	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	22	5	mg/kg
Selenium	ND	20	mg/kg
Silver	18	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	150	5	mg/kg
Vanadium	27	10	mg/kg
Zinc	5300	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	41000	100	mg/kg
Potassium	1800	100	mg/kg
Magnesium	19000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	530	200	mg/kg
Silicon	270	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

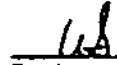
Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.



Analyst



Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-22  
Project ID: Rico, Colorado  
Laboratory ID: B947376  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	12000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	120	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	33	2	mg/kg
Chromium	18	5	mg/kg
Cobalt	12	5	mg/kg
Copper	200	5	mg/kg
Iron	24000	100	mg/kg
Lead	2000	20	mg/kg
Manganese	1500	100	mg/kg
Mercury	0.6	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	12	5	mg/kg
Selenium	13	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	120	5	mg/kg
Vanadium	24	10	mg/kg
Zinc	4400	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	22000	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	6600	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	620	200	mg/kg
Silicon	180	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-23  
Project ID: Rico, Colorado  
Laboratory ID: B947377  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	11000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	29	20	mg/kg
Barium	110	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	11	2	mg/kg
Chromium	19	5	mg/kg
Cobalt	9	5	mg/kg
Copper	160	5	mg/kg
Iron	29000	100	mg/kg
Lead	800	20	mg/kg
Manganese	2500	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	15	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	190	5	mg/kg
Vanadium	24	10	mg/kg
Zinc	2000	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	5300	100	mg/kg
Potassium	2000	100	mg/kg
Magnesium	7400	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	580	200	mg/kg
Silicon	630	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-24  
Project ID: Rico, Colorado  
Laboratory ID: B947378  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	11000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	30	20	mg/kg
Barium	150	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	11	2	mg/kg
Chromium	18	5	mg/kg
Cobalt	11	5	mg/kg
Copper	190	5	mg/kg
Iron	38000	100	mg/kg
Lead	1000	20	mg/kg
Manganese	1900	100	mg/kg
Mercury	0.4	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	18	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	170	5	mg/kg
Vanadium	25	10	mg/kg
Zinc	1700	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	7300	100	mg/kg
Potassium	1900	100	mg/kg
Magnesium	8000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	740	200	mg/kg
Silicon	390	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-26  
Project ID: Rico, Colorado  
Laboratory ID: B947380  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	15000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	27	20	mg/kg
Barium	680	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	9	2	mg/kg
Chromium	37	5	mg/kg
Cobalt	12	5	mg/kg
Copper	310	5	mg/kg
Iron	61000	100	mg/kg
Lead	1600	20	mg/kg
Manganese	13000	100	mg/kg
Mercury	0.9	0.2	mg/kg
Molybdenum	23	20	mg/kg
Nickel	25	5	mg/kg
Selenium	ND	20	mg/kg
Silver	41	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	280	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	4000	20	mg/kg
Gold	ND	100	mg/kg
Boron	26	50	mg/kg
Calcium	28000	100	mg/kg
Potassium	2600	100	mg/kg
Magnesium	12000	100	mg/kg
Sodium	340	200	mg/kg
Phosphorous	1100	200	mg/kg
Silicon	210	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
 Sample ID: RS-25  
 Project ID: Rico, Colorado  
 Laboratory ID: B947379  
 Sample Matrix: Soil

Date Reported: 08/29/94  
 Date Sampled: 08/10/94  
 Date Received: 08/13/94  
 Date Digested: 08/24/94  
 Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	7700	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	40	20	mg/kg
Barium	380	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	4	2	mg/kg
Chromium	15	5	mg/kg
Cobalt	6	5	mg/kg
Copper	200	5	mg/kg
Iron	63000	100	mg/kg
Lead	1200	20	mg/kg
Manganese	1200	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	11	5	mg/kg
Selenium	ND	20	mg/kg
Silver	12	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	180	5	mg/kg
Vanadium	28	10	mg/kg
Zinc	1100	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	5700	100	mg/kg
Potassium	1900	100	mg/kg
Magnesium	3600	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	490	200	mg/kg
Silicon	1300	100	mg/kg
Yttrium	ND	50	mg/kg


ND - Parameter not detected at stated Detection Limit.


## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

  
 Analyst

  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-26  
Project ID: Rico, Colorado  
Laboratory ID: B947380  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	15000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	27	20	mg/kg
Barium	680	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	9	2	mg/kg
Chromium	37	5	mg/kg
Cobalt	12	5	mg/kg
Copper	310	5	mg/kg
Iron	61000	100	mg/kg
Lead	1600	20	mg/kg
Manganese	13000	100	mg/kg
Mercury	0.9	0.2	mg/kg
Molybdenum	23	20	mg/kg
Nickel	25	5	mg/kg
Selenium	ND	20	mg/kg
Silver	41	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	280	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	4000	20	mg/kg
Gold	ND	100	mg/kg
Boron	26	50	mg/kg
Calcium	28000	100	mg/kg
Potassium	2600	100	mg/kg
Magnesium	12000	100	mg/kg
Sodium	340	200	mg/kg
Phosphorous	1100	200	mg/kg
Silicon	210	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.



Analyst



Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-27  
Project ID: Rico, Colorado  
Laboratory ID: B947381  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	9900	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	25	20	mg/kg
Barium	310	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	14	2	mg/kg
Chromium	15	5	mg/kg
Cobalt	9	5	mg/kg
Copper	150	5	mg/kg
Iron	26000	100	mg/kg
Lead	500	20	mg/kg
Manganese	12000	100	mg/kg
Mercury	ND	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	17	5	mg/kg
Selenium	ND	20	mg/kg
Silver	48	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	130	5	mg/kg
Vanadium	22	10	mg/kg
Zinc	1500	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	23000	100	mg/kg
Potassium	2100	100	mg/kg
Magnesium	16000	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	830	200	mg/kg
Silicon	620	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: RS-28  
Project ID: Rico, Colorado  
Laboratory ID: B947382  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/10/94  
Date Received: 08/13/94  
Date Digested: 08/24/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	13000	100	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	130	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	17	2	mg/kg
Chromium	21	5	mg/kg
Cobalt	10	5	mg/kg
Copper	420	5	mg/kg
Iron	37000	100	mg/kg
Lead	3500	20	mg/kg
Manganese	2000	100	mg/kg
Mercury	0.3	0.2	mg/kg
Molybdenum	ND	20	mg/kg
Nickel	14	5	mg/kg
Selenium	ND	20	mg/kg
Silver	14	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	170	5	mg/kg
Vanadium	28	10	mg/kg
Zinc	2600	20	mg/kg
Gold	ND	100	mg/kg
Boron	ND	50	mg/kg
Calcium	8700	100	mg/kg
Potassium	1600	100	mg/kg
Magnesium	7900	100	mg/kg
Sodium	ND	200	mg/kg
Phosphorous	590	200	mg/kg
Silicon	430	100	mg/kg
Yttrium	ND	50	mg/kg

ND - Parameter not detected at stated Detection Limit.


## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor  
technique), SW-846, September 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-01  
Project ID: Rico, Colorado  
Laboratory ID: B947383  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Received: 08/13/94  
Date Extracted: 08/16/94  
Date Analyzed: 08/17/94

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-01  
Laboratory ID: B947383  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Analyzed: 08/17/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-01  
Laboratory ID: B947383  
Sample Matrix: Soil

Date Reported: 08/29/94  
Date Sampled: 08/09/94  
Date Analyzed: 08/17/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

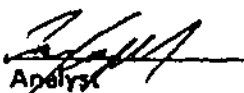
Unknown concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	107	70 - 121
Toluene-d8	99	81 - 117
Bromofluorobenzene	102	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: WALSH &amp; ASSOCIATES, INC.

Sample ID: T-01

Date Reported: 08/30/94

Project ID: Rico, Colorado

Date Sampled: 08/09/94

Laboratory ID: B947383

Date Received: 08/13/94

Sample Matrix: Soil

Date Extracted: 08/18/94

Date Analyzed: 08/30/94

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
2,4-Dichlorophenol	ND	1	mg/kg
1,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: **WALSH & ASSOCIATES, INC.**  
 Sample ID: **T-01**  
 Laboratory ID: **B947383**  
 Sample Matrix: **Soil**

Date Reported: **08/30/94**  
 Date Sampled: **08/09/94**  
 Date Analyzed: **08/30/94**

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
i-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GCMS.

B - Compound detected in Method Blank.

[illegible]

*PRIVILEGED AND CONFIDENTIAL*

**WATER ANALYTICAL DATA**

## **CASE NARRATIVE**

On June 18, 1994, five water samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for ICP scan for metals and mercury. Client name/Project name was listed as Walsh & Associates / 1897-010 / Rico Co.

Detectable amounts of targeted compounds were present in some of the samples.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.



Wynn Sudtelgte  
IML-Bozeman

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RW-01  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945778  
 Sample Matrix: Water  
 Preservation: Cool; HNO3  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/15/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	ND	0.2	mg/L
Antimony	ND	0.2	mg/L
Arsenic	ND	0.2	mg/L
Barium	ND	0.5	mg/L
Beryllium	ND	0.02	mg/L
Cadmium	ND	0.02	mg/L
Chromium	ND	0.05	mg/L
Cobalt	ND	0.05	mg/L
Copper	ND	0.05	mg/L
Iron	0.13	0.05	mg/L
Lead	ND	0.2	mg/L
Manganese	0.11	0.05	mg/L
Mercury	ND	0.001	mg/L
Molybdenum	ND	0.05	mg/L
Nickel	ND	0.05	mg/L
Selenium	ND	0.2	mg/L
Silver	ND	0.1	mg/L
Thallium	ND	0.2	mg/L
Titanium	ND	0.05	mg/L
Vanadium	ND	0.1	mg/L
Zinc	0.22	0.05	mg/L
Gold	ND	2	mg/L
Boron	ND	1	mg/L
Calcium	24	1	mg/L
Potassium	ND	1	mg/L
Magnesium	2.6	1	mg/L
Sodium	ND	2	mg/L
Phosphorous	ND	2	mg/L
Silicon	1.7	1	mg/L
Yttrium	ND	0.5	mg/L

ND - Compound not detected at stated Detection Limit.

## References:

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
 for Total Metals, SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
 technique), SW-846, September 1986.

Se  
 Analyst

WJ  
 Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RW-02  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945779  
 Sample Matrix: Water  
 Preservation: Cool; HNO3  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/16/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	180	0.2	mg/L
Antimony	ND	0.2	mg/L
Arsenic	ND	0.2	mg/L
Barium	ND	0.5	mg/L
Beryllium	ND	0.02	mg/L
Cadmium	0.33	0.02	mg/L
Chromium	ND	0.05	mg/L
Cobalt	0.13	0.05	mg/L
Copper	12	0.05	mg/L
Iron	0.39	0.05	mg/L
Lead	ND	0.2	mg/L
Manganese	40	0.05	mg/L
Mercury	ND	0.001	mg/L
Molybdenum	ND	0.05	mg/L
Nickel	0.39	0.05	mg/L
Selenium	ND	0.2	mg/L
Silver	ND	0.1	mg/L
Thallium	ND	0.2	mg/L
Titanium	ND	0.05	mg/L
Vanadium	ND	0.1	mg/L
Zinc	40	0.05	mg/L
Gold	ND	2	mg/L
Boron	ND	1	mg/L
Calcium	270	1	mg/L
Potassium	2.5	1	mg/L
Magnesium	170	1	mg/L
Sodium	2.1	2	mg/L
Phosphorous	ND	2	mg/L
Silicon	38	1	mg/L
Yttrium	0.6	0.5	mg/L

ND - Compound not detected at stated Detection Limit.

## References:

Method 3010: Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor Technique), SW-846, September 1986.

SP  
Analyst

LS  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RW-03  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945780  
 Sample Matrix: Water  
 Preservation: Cool; HNO3  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/16/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	0.2	0.2	mg/L
Antimony	ND	0.2	mg/L
Arsenic	ND	0.2	mg/L
Barium	ND	0.5	mg/L
Beryllium	ND	0.02	mg/L
Cadmium	ND	0.02	mg/L
Chromium	ND	0.05	mg/L
Cobalt	ND	0.05	mg/L
Copper	ND	0.05	mg/L
Iron	0.34	0.05	mg/L
Lead	ND	0.2	mg/L
Manganese	0.76	0.05	mg/L
Mercury	ND	0.001	mg/L
Molybdenum	ND	0.05	mg/L
Nickel	ND	0.05	mg/L
Selenium	ND	0.2	mg/L
Silver	ND	0.1	mg/L
Thallium	ND	0.2	mg/L
Titanium	ND	0.05	mg/L
Vanadium	ND	0.1	mg/L
Zinc	0.39	0.05	mg/L
Gold	ND	2	mg/L
Boron	ND	1	mg/L
Calcium	310	1	mg/L
Potassium	2.9	1	mg/L
Magnesium	24	1	mg/L
Sodium	14	2	mg/L
Phosphorous	ND	2	mg/L
Silicon	5.9	1	mg/L
Yttrium	ND	0.5	mg/L

ND - Compound not detected at stated Detection Limit.

## References:

Method 3010: Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor Technique), SW-846, September 1986.

SE  
Analyst

LS  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RW-04  
 Project ID: 1897-010 / Rico. Co  
 Laboratory ID: B945781  
 Sample Matrix: Water  
 Preservation: Cool; HNO3  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/16/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	0.4	0.2	mg/L
Antimony	ND	0.2	mg/L
Arsenic	ND	0.2	mg/L
Barium	ND	0.5	mg/L
Beryllium	ND	0.02	mg/L
Cadmium	ND	0.02	mg/L
Chromium	ND	0.05	mg/L
Cobalt	ND	0.05	mg/L
Copper	ND	0.05	mg/L
Iron	0.13	0.05	mg/L
Lead	ND	0.2	mg/L
Manganese	0.06	0.05	mg/L
Mercury	ND	0.001	mg/L
Molybdenum	ND	0.05	mg/L
Nickel	ND	0.05	mg/L
Selenium	ND	0.2	mg/L
Silver	ND	0.1	mg/L
Thallium	ND	0.2	mg/L
Titanium	ND	0.05	mg/L
Vanadium	ND	0.1	mg/L
Zinc	0.08	0.05	mg/L
Gold	ND	2	mg/L
Boron	ND	1	mg/L
Calcium	36	1	mg/L
Potassium	ND	1	mg/L
Magnesium	4.7	1	mg/L
Sodium	ND	2	mg/L
Phosphorous	ND	2	mg/L
Silicon	3.3	1	mg/L
Yttrium	ND	0.5	mg/L

ND - Compound not detected at stated Detection Limit.

## References:

Method 3010: Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor technique), SW-846, September 1986.

SE  
Analyst

LS  
Reviewed

EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES

Client: WALSH & ASSOCIATES, INC.  
Sample ID: T-01  
Laboratory ID: B947383  
Sample Matrix: Soil

Date Reported: 08/30/94  
Date Sampled: 08/09/94  
Date Analyzed: 08/30/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.


Unknown concentration calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	71	25 - 121
Phenol-d6	101	24 - 113
Nitrobenzene-d5	77	23 - 120
2-Fluorobiphenyl	85	30 - 115
2,4,6-Tribromophenol	86	19 - 122
Terphenyl-d14	87	18 - 137

## Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: RW-05  
 Project ID: 1897-010 / Rico Co  
 Laboratory ID: B945782  
 Sample Matrix: Water  
 Preservation: Cool; HNO3  
 Condition: Intact

Date Reported: 07/12/94  
 Date Sampled: 06/16/94  
 Date Received: 06/18/94  
 Date Extracted: 07/05/94  
 Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	0.4	0.2	mg/L
Antimony	ND	0.2	mg/L
Arsenic	ND	0.2	mg/L
Barium	ND	0.5	mg/L
Beryllium	ND	0.02	mg/L
Cadmium	ND	0.02	mg/L
Chromium	ND	0.05	mg/L
Cobalt	ND	0.05	mg/L
Copper	ND	0.05	mg/L
Iron	0.09	0.05	mg/L
Lead	ND	0.2	mg/L
Manganese	ND	0.05	mg/L
Mercury	ND	0.001	mg/L
Molybdenum	ND	0.05	mg/L
Nickel	ND	0.05	mg/L
Selenium	ND	0.2	mg/L
Silver	ND	0.1	mg/L
Thallium	ND	0.2	mg/L
Titanium	ND	0.05	mg/L
Vanadium	ND	0.1	mg/L
Zinc	ND	0.05	mg/L
Gold	ND	2	mg/L
Boron	ND	1	mg/L
Calcium	21	1	mg/L
Potassium	ND	1	mg/L
Magnesium	3.1	1	mg/L
Sodium	ND	2	mg/L
Phosphorous	ND	2	mg/L
Silicon	2.9	1	mg/L
Yttrium	ND	0.5	mg/L

ND - Compound not detected at stated Detection Limit.

## References:

Method 3010: Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy, SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor Technique), SW-846, September 1986.

SP  
Analyst

WS  
Reviewed



*PRIVILEGED AND CONFIDENTIAL*

**ASSAY BUILDING ANALYTICAL DATA**


### **CASE NARRATIVE**

On July 2, 1994, seven samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for Toxicity Characteristic Leaching Procedure Parameters on one sample, with volatile organic compounds, semivolatile organic compounds, sulfates, cyanide, and metals requested on the others. Client name / Project name was listed as Walsh & Associates / Rico Assay Bldg / 1897-010 / Rico, CO.

Detectable amounts of targeted compounds were present in some of the samples.

The Toxicity Characteristic Leaching Procedure methodology used is outlined in the Federal Register, 40 CFR 261, Vol. 55, No. 126, June 29, 1990. Results are reported in mass per unit volume of leachate (mg/L).

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

  
Wynn Sudtelge  
IML-Bozeman

0729wa

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP01	Date Reported:	07/22/94
Project ID:	Rico Assay Bldg. 1897-010	Date Sampled:	06/30/94
Laboratory ID:	B946403	Date Received:	07/02/94
Sample Matrix:	Soil	Date Extracted:	07/06/94
Preservation:	Cool	Date Analyzed:	07/06/94
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
3utanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP01  
Laboratory ID: 8946403  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 SP01	Date Sampled:	06/30/94
Laboratory ID:	B946403	Date Analyzed:	07/06/94
Sample Matrix:	Soil		

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

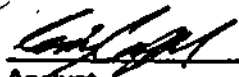
Unknown concentrations calculated assuming a Relative Response Factor = 1.


## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	93	70 - 121
Toluene-d8	100	81 - 117
Bromofluorobenzene	99	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP01	Date Reported:	07/25/94
Project ID:	Rico Assay Bldg. 1897-010	Date Sampled:	06/30/94
Laboratory ID:	B946403	Date Received:	07/02/94
Sample Matrix:	Soil	Date Extracted:	07/07/94
Preservation:	Cool	Date Analyzed:	07/18/94
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	0.7	J	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP01  
Laboratory ID: B946403  
Sample Matrix: Soil

Date Reported: 07/25/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/18/94

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	0.9 J	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	0.7 J	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GC/MS.

B - Compound detected in Method Blank.

**EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES	Date Reported:	07/25/94
Sample ID:	1897 SP01	Date Sampled:	06/30/94
Laboratory ID:	B946403	Date Analyzed:	07/18/94
Sample Matrix:	Soil		

Tentative identification	Retention Time (minutes)	Concentration	Units
Unknown hydrocarbon	21.66	4	mg/kg
Unknown hydrocarbon	30.50	2	mg/kg
Unknown hydrocarbon	32.52	3	mg/kg
Unknown hydrocarbon	35.23	3	mg/kg
Unknown hydrocarbon	39.10	3	mg/kg

Unknown concentration calculated assuming Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	59	25 - 121
Phenol-d6	79	24 - 113
Nitrobenzene-d5	74	23 - 120
2-Fluorobiphenyl	76	30 - 115
2,4,6-Tribromophenol	83	19 - 122
Terphenyl-d14	54	18 - 137

**Reference:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client:	WALSH & ASSOCIATES	Date Reported:	07/26/94
Sample ID:	1897 SP01	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	8946403	Date Extracted :	07/11/94
Sample Matrix:	Soil	Date Analyzed:	07/20/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Level	Units
Aluminum	16000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	210	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	9	2	mg/kg
Chromium	20	5	mg/kg
Cobalt	9	5	mg/kg
Copper	150	5	mg/kg
Iron	24000	200	mg/kg
Lead	880	20	mg/kg
Mercury	16	0.5	mg/kg
Manganese	2800	5	mg/kg
Molybdenum	ND	5	mg/kg
Nickel	15	5	mg/kg
Selenium	ND	20	mg/kg
Silver	20	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	200	5	mg/kg
Vanadium	27	10	mg/kg
Zinc	1800	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	9000	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	7700	100	mg/kg
Sodium	340	200	mg/kg
Phosphorous	850	200	mg/kg
Silicon	210	100	mg/kg
Yttrium	16	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.  
Analyst  
Reviewed

## GENERAL PARAMETERS


Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP01 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: B946403 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	150	10	mg/kg

Sulfate result is suspect. Barium sulfate precipitation had dark flakes in the filtrate.

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 SP02	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946404	Date Extracted:	07/06/94
Sample Matrix:	Soil	Date Analyzed:	07/06/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP02  
Laboratory ID: B946404  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 SP02	Date Sampled:	06/30/94
Laboratory ID:	8946404	Date Analyzed:	07/06/94
Sample Matrix:	Soil		

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Known concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	93	70 - 121
Toluene-d8	100	81 - 117
Bromofluorobenzene	99	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

<b>Client:</b>	<b>WALSH &amp; ASSOCIATES</b>		
<b>Sample ID:</b>	<b>1897 SP02</b>	<b>Date Reported:</b>	<b>07/25/94</b>
<b>Project ID:</b>	<b>Rico Assay Bldg. 1897-010</b>	<b>Date Sampled:</b>	<b>06/30/94</b>
<b>Laboratory ID:</b>	<b>B946404</b>	<b>Date Received:</b>	<b>07/02/94</b>
<b>Sample Matrix:</b>	<b>Soil</b>	<b>Date Extracted:</b>	<b>07/07/94</b>
<b>Preservation:</b>	<b>Cool</b>	<b>Date Analyzed:</b>	<b>07/18/94</b>
<b>Condition:</b>	<b>Intact</b>		

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

<b>Client:</b>	<b>WALSH &amp; ASSOCIATES</b>		
<b>Sample ID:</b>	<b>1897 SP02</b>	<b>Date Reported:</b>	<b>07/25/94</b>
<b>Laboratory ID:</b>	<b>B946404</b>	<b>Date Sampled:</b>	<b>06/30/94</b>
<b>Sample Matrix:</b>	<b>Soil</b>	<b>Date Analyzed:</b>	<b>07/18/94</b>

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GC/MS.

B - Compound detected in Method Blank.

EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP02  
Laboratory ID: B946404  
Sample Matrix: Soil

Date Reported: 07/25/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/18/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
Unknown hydrocarbon	21.66	1	mg/kg
Unknown hydrocarbon	30.49	1	mg/kg
Unknown hydrocarbon	32.53	1	mg/kg
Unknown hydrocarbon	35.21	1	mg/kg
Unknown hydrocarbon	39.08	1	mg/kg

Unknown concentration calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	57	25 - 121
Phenol-d6	76	24 - 113
Nitrobenzene-d5	71	23 - 120
2-Fluorobiphenyl	74	30 - 115
2,4,6-Tribromophenol	84	19 - 122
Terphenyl-d14	51	18 - 137

## Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Third Edition, November 1986.

  
Analyst  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP02  
Project ID: Rico Assay Bldg. 1897-010  
Laboratory ID: B946404  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Date Reported: 07/26/94  
Date Sampled: 06/30/94  
Date Received: 07/02/94  
Date Extracted: 07/11/94  
Date Analyzed: 07/20/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	13000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	170	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	13	2	mg/kg
Chromium	16	5	mg/kg
Cobalt	8	5	mg/kg
Copper	190	5	mg/kg
Iron	22000	200	mg/kg
Lead	1100	20	mg/kg
Mercury	1.4	0.5	mg/kg
Manganese	8500	5	mg/kg
Molybdenum	7	5	mg/kg
Nickel	12	5	mg/kg
Selenium	ND	20	mg/kg
Silver	45	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	120	5	mg/kg
Vanadium	22	10	mg/kg
Zinc	2100	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	21000	100	mg/kg
Potassium	1700	100	mg/kg
Magnesium	7800	100	mg/kg
Sodium	300	200	mg/kg
Phosphorous	670	200	mg/kg
Silicon	320	100	mg/kg
Yttrium	13	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

Analyst

Reviewed

## GENERAL PARAMETERS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP02 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: B946404 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	97	10	mg/kg

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
Analyst

  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP03  
Project ID: Rico Assay Bldg. 1897-010  
Laboratory ID: B946405  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Received: 07/02/94  
Date Extracted: 07/06/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP03  
Laboratory ID: B946405  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

**EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS**

Client: **WALSH & ASSOCIATES**  
Sample ID: **1897 SP03**  
Laboratory ID: **B946405**  
Sample Matrix: **Soil**

Date Reported: **07/22/94**  
Date Sampled: **06/30/94**  
Date Analyzed: **07/06/94**

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.


Unknown concentrations calculated assuming a Relative Response Factor = 1.


**QUALITY CONTROL:**

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	93	70 - 121
Toluene-d8	99	81 - 117
Bromofluorobenzene	100	74 - 121

**References:**

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES	Date Reported:	07/25/94
Sample ID:	1897 SP03	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946405	Date Extracted:	07/07/94
Sample Matrix:	Soil	Date Analyzed:	07/18/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
benzo(a)anthracene	ND	1	mg/kg
benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

<b>Client:</b>	<b>WALSH &amp; ASSOCIATES</b>		
<b>Sample ID:</b>	<b>1897 SP03</b>	<b>Date Reported:</b>	<b>07/25/94</b>
<b>Laboratory ID:</b>	<b>B946405</b>	<b>Date Sampled:</b>	<b>06/30/94</b>
<b>Sample Matrix:</b>	<b>Soil</b>	<b>Date Analyzed:</b>	<b>07/18/94</b>

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Brysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GC/MS.

B - Compound detected in Method Blank.

EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP03  
Laboratory ID: 8946405  
Sample Matrix: Soil

Date Reported: 07/25/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/18/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	54	25 - 121
Phenol-d6	83	24 - 113
Nitrobenzene-d5	75	23 - 120
2-Fluorobiphenyl	76	30 - 115
2,4,6-Tribromophenol	72	19 - 122
Terphenyl-d14	60	18 - 137

## Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client:	WALSH & ASSOCIATES	Date Reported:	07/26/94
Sample ID:	1897 SP03	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946405	Date Extracted:	07/11/94
Sample Matrix:	Soil	Date Analyzed:	07/20/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Level	Units
Aluminum	11000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	22	20	mg/kg
Barium	98	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	7	2	mg/kg
Chromium	16	5	mg/kg
Cobalt	9	5	mg/kg
Copper	180	5	mg/kg
Iron	37000	200	mg/kg
Lead	1050	20	mg/kg
Mercury	ND	0.5	mg/kg
Manganese	1500	5	mg/kg
Molybdenum	ND	5	mg/kg
Nickel	16	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	120	5	mg/kg
Vanadium	23	10	mg/kg
Zinc	1100	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	2700	100	mg/kg
Potassium	1800	100	mg/kg
Magnesium	8100	100	mg/kg
Sodium	240	200	mg/kg
Phosphorous	690	200	mg/kg
Silicon	230	100	mg/kg
Yttrium	22	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.

  
 Analyst

  
 Reviewed


## GENERAL PARAMETERS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP03 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: 8946405 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	120	10	mg/kg

Sulfate result is suspect. Barium sulfate precipitation was tan, not white as expected.

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 SP04	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946406	Date Extracted:	07/06/94
Sample Matrix:	Soil	Date Analyzed:	07/06/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP04  
Laboratory ID: B946406  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP04  
Laboratory ID: B946406  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

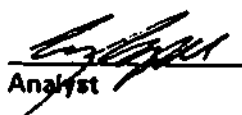
Unknown concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	90	70 - 121
Toluene-d8	105	81 - 117
Bromofluorobenzene	96	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: **WALSH & ASSOCIATES**Sample ID: **1897 SP04**Date Reported: **07/25/94**Project ID: **Rico Assay Bldg. 1897-010**Date Sampled: **06/30/94**Laboratory ID: **B946406**Date Received: **07/02/94**Sample Matrix: **Soil**Date Extracted: **07/07/94**Preservation: **Cool**Date Analyzed: **07/18/94**Condition: **Intact**

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: **WALSH & ASSOCIATES**  
 Sample ID: **1897 SP04**  
 Laboratory ID: **B946406**  
 Sample Matrix: **Soil**

Date Reported: **07/25/94**  
 Date Sampled: **06/30/94**  
 Date Analyzed: **07/18/94**

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Brysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GCMS.

B - Compound detected in Method Blank.

EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP04	Date Reported:	07/25/94
Laboratory ID:	B946406	Date Sampled:	06/30/94
Sample Matrix:	Soil	Date Analyzed:	07/18/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	58	25 - 121
Phenol-d6	86	24 - 113
Nitrobenzene-d5	75	23 - 120
2-Fluorobiphenyl	76	30 - 115
2,4,6-Tribromophenol	75	19 - 122
Terphenyl-d14	57	18 - 137

## Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
Analyst  
Reviewed

## TOTAL METALS ANALYSIS

Client:	WALSH & ASSOCIATES	Date Reported:	07/26/94
Sample ID:	1897 SP04	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946406	Date Extracted :	07/11/94
Sample Matrix:	Soil	Date Analyzed:	07/20/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Level	Units
Aluminum	16000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	29	20	mg/kg
Barium	120	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	5	2	mg/kg
Chromium	20	5	mg/kg
Cobalt	10	5	mg/kg
Copper	40	5	mg/kg
Iron	26000	200	mg/kg
Lead	760	20	mg/kg
Mercury	ND	0.5	mg/kg
Manganese	1200	5	mg/kg
Molybdenum	ND	5	mg/kg
Nickel	14	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	240	5	mg/kg
Vanadium	30	10	mg/kg
Zinc	1100	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	3800	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	7800	100	mg/kg
Sodium	230	200	mg/kg
Phosphorous	650	200	mg/kg
Silicon	360	100	mg/kg
Yttrium	14	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.  
Analyst  
Reviewed


## GENERAL PARAMETERS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP04 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: B946406 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	280	10	mg/kg

Sulfate result is suspect. Sample had a colloidal suspension that could not be filtered out. When acidified, the suspension precipitated. Filtration was performed; however, all precipitation was not filterable before addition of barium chloride.

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**EPA METHOD 8240  
HSL VOLATILE COMPOUNDS**

Client: **WALSH & ASSOCIATES**  
Sample ID: **1897 SP05**  
Project ID: **Rico Assay Bldg. 1897-010**  
Laboratory ID: **B946407**  
Sample Matrix: **Soil**  
Preservation: **Cool**  
Condition: **Intact**

Date Reported: **07/22/94**  
Date Sampled: **06/30/94**  
Date Received: **07/02/94**  
Date Extracted: **07/06/94**  
Date Analyzed: **07/06/94**

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
TENTATIVELY IDENTIFIED COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 CI  
Laboratory ID: B946409  
Sample Matrix: Soil

Date Reported: 07/25/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/20/94

Parameter	Retention Time(min.)	Concentration	Units
-----------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recoveries	%
2-Fluorophenol	62
Phenol-d6	70
Nitrobenzene-d5	85
2-Fluorobiphenyl	88
2,4,6-Tribromophenol	106
Terphenyl-d14	114

## References:

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP05  
Laboratory ID: B946407  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

**EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS**

Client: **WALSH & ASSOCIATES**  
Sample ID: **1897 SP05**  
Laboratory ID: **B946407**  
Sample Matrix: **Soil**

Date Reported: **07/22/94**  
Date Sampled: **06/30/94**  
Date Analyzed: **07/06/94**

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.


known concentrations calculated assuming a Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	89	70 - 121
Toluene-d8	105	81 - 117
Bromofluorobenzene	96	74 - 121

**References:**

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

<b>Client:</b>	<b>WALSH &amp; ASSOCIATES</b>		
<b>Sample ID:</b>	<b>1897 SP05</b>	<b>Date Reported:</b>	<b>07/25/94</b>
<b>Project ID:</b>	<b>Rico Assay Bldg. 1897-010</b>	<b>Date Sampled:</b>	<b>06/30/94</b>
<b>Laboratory ID:</b>	<b>B946407</b>	<b>Date Received:</b>	<b>07/02/94</b>
<b>Sample Matrix:</b>	<b>Soil</b>	<b>Date Extracted:</b>	<b>07/07/94</b>
<b>Preservation:</b>	<b>Cool</b>	<b>Date Analyzed:</b>	<b>07/19/94</b>
<b>Condition:</b>	<b>Intact</b>		

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES	Date Reported:	07/25/94
Sample ID:	1897 SP05	Date Sampled:	06/30/94
Laboratory ID:	B946407	Date Analyzed:	07/19/94
Sample Matrix:	Soil		

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	59	25 - 121
Phenol-d6	80	24 - 113
Nitrobenzene-d5	68	23 - 120
2-Fluorobiphenyl	77	30 - 115
2,4,6-Tribromophenol	81	19 - 122
Terphenyl-d14	55	18 - 137

**Reference:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES	Date Reported:	07/25/94
Sample ID:	1897 SP05	Date Sampled:	06/30/94
Laboratory ID:	B946407	Date Analyzed:	07/19/94
Sample Matrix:	Soil		

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.


**QUALITY CONTROL:**

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	59	25 - 121
Phenol-d6	80	24 - 113
Nitrobenzene-d5	68	23 - 120
2-Fluorobiphenyl	77	30 - 115
2,4,6-Tribromophenol	81	19 - 122
Terphenyl-d14	55	18 - 137

**Reference:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

## TOTAL METALS ANALYSIS

Client: WALSH & ASSOCIATES  
 Sample ID: 1897 SP05  
 Project ID: Rico Assay Bldg. 1897-010  
 Laboratory ID: B946407  
 Sample Matrix: Soil  
 Preservation: Cool  
 Condition: Intact

Date Reported: 07/26/94  
 Date Sampled: 06/30/94  
 Date Received: 07/02/94  
 Date Extracted: 07/11/94  
 Date Analyzed: 07/20/94

Parameter	Analytical Result	Detection Level	Units
Aluminum	7000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	71	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	7	2	mg/kg
Chromium	12	5	mg/kg
Cobalt	6	5	mg/kg
Copper	160	5	mg/kg
Iron	20000	200	mg/kg
Lead	1300	20	mg/kg
Mercury	ND	0.5	mg/kg
Manganese	1200	5	mg/kg
Molybdenum	ND	5	mg/kg
Nickel	9	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	150	5	mg/kg
Vanadium	19	10	mg/kg
Zinc	1300	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	2900	100	mg/kg
Potassium	1050	100	mg/kg
Magnesium	4900	100	mg/kg
Sodium	240	200	mg/kg
Phosphorous	390	200	mg/kg
Silicon	340	100	mg/kg
Yttrium	7	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
 SW-846, September 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
 Spectroscopy, SW-846, September 1986.

  
 Analyst

  
 Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP05	Date Reported:	07/25/94
Laboratory ID:	B946407	Date Sampled:	06/30/94
Sample Matrix:	Soil	Date Analyzed:	07/19/94

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GCMS.

B - Compound detected in Method Blank.

**AB QA/QC**  
**SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS**  
**METHOD BLANK**

Date Analyzed: 07/18/94  
 Laboratory ID: SMB-188  
 Sample Matrix: Soil  
 Date Extracted: 07/07/94

Parameter	Analytical Result	Detection Limit	Units
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	1	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
di-n-Butylphthalate	ND	1	mg/kg
di-n-Octylphthalate	ND	1	mg/kg
benz(a,h)acridine	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indene	ND	1	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg
Pyridine	ND	1	mg/kg
Quinoline	ND	1	mg/kg

ND - Compound not detected at stated Detection Limits.

\* - Compounds Coelute by GC/MS.

AB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK  
TENTATIVELY IDENTIFIED COMPOUNDS

Date Analyzed: 07/18/94  
Laboratory ID: SMB-188  
Sample Matrix: Soil  
Date Extracted: 07/07/94

Tentatively Identification	Retention Time (min.)	Concentration	Units
-------------------------------	--------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:


Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	60	25 - 121
Phenol-d6	76	24 - 113
Nitrobenzene-d5	70	23 - 120
2-Fluorobiphenyl	71	30 - 115
2,4,6-Tribromophenol	78	19 - 122
Terphenyl-d14	51	18 - 137

Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for  
Semivolatile Organics, Test Methods for Evaluating Solid Wastes,  
SW846, USEPA, Third Edition, November 1986.

USEPA Contract Lab Program, Statement of Work for Organic  
Analysis, Multi-Media, Multi-Concentration, OLM01.0, December 1990.

  
Analyst

  
Reviewed

**LAB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK**

Date Analyzed: 07/20/94  
Laboratory ID: TMB94-24  
Sample Matrix: Water  
Date Extracted: 07/11/94

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.01	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.01	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.01	2
4,5-Trichlorophenol	ND	0.01	400
2,4-Dinitrotoluene	ND	0.01	0.13
Hexachlorobenzene	ND	0.01	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.01	200 **
m & p-Cresol *	ND	0.01	200 **
Pyridine	ND	0.01	5

ND - Compound not detected at stated Detection Limit

B - Compound detected in Method Blank.

\* - Compounds coelute by GCMS.

\*\* - Regulatory Limit of combined Cresols.

**AB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK**

Date Analyzed: 07/20/94  
Laboratory ID: B9224  
Sample Matrix: Water  
Date Extracted: 07/11/94

Parameter	Retention Time(min.)	Concentration	Units
-----------	-------------------------	---------------	-------

No additional compounds found at reportable limits.

Unknown concentrations calculated assuming Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recoveries	%
2-Fluorophenol	56
Phenol-d6	64
Nitrobenzene-d5	78
2-Fluorobiphenyl	83
2,4,6-Tribromophenol	102
Terphenyl-d14	73

**References:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile Organics, Test Methods for Evaluating Solid Wastes, United States Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

  
Analyst

  
Reviewed

**LAB QA/QC  
TOXICITY CHARACTERISTIC LEACHING PROCEDURE - CHLORINATED HERBICIDES  
METHOD BLANK**

Date Analyzed: 07/18/94  
Laboratory ID: TMB-94-24  
Sample Matrix: Water

Parameter	Analytical Results	Detection Limits	Units
2,4-D	ND	0.05	mg/L
2,4,5-TP (Silvex)	ND	0.05	mg/L

All quantities are expressed as total nanograms.


**QUALITY CONTROL**

Surrogate Recoveries:	%
DCAA	63

**References:**

Method 515.1, Determination of Chlorinated Acids in Water by Gas Chromatography with an Electron Capture Detector, EPA/600/4-88/039, December 1988.

  
\_\_\_\_\_  
Analyst


  
\_\_\_\_\_  
Reviewed

## GENERAL PARAMETERS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP05 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: 8946407 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	110	10	mg/kg

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 SP06	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946408	Date Extracted:	07/06/94
Sample Matrix:	Soil	Date Analyzed:	07/06/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,1,1-Trichloroethane	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
2-Butanone (MEK)	ND	1	mg/kg
2-Hexanone	ND	0.2	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	0.2	mg/kg
Acetone	ND	1	mg/kg
Benzene	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
Chloromethane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
Methylene chloride	ND	1	mg/kg
o-Xylene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg

EPA METHOD 8240  
HSL VOLATILE COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP06  
Laboratory ID: B946408  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Tetrachloroethene (PCE)	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
trans-1,2-Dichloroethene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene (TCE)	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

EPA METHOD 8240  
TENTATIVELY IDENTIFIED COMPOUNDS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP06  
Laboratory ID: B946408  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/06/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	90	70 - 121
Toluene-d8	106	81 - 117
Bromofluorobenzene	97	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP06	Date Reported:	07/25/94
Project ID:	Rico Assay Bldg. 1897-010	Date Sampled:	06/30/94
Laboratory ID:	8946408	Date Received:	07/02/94
Sample Matrix:	Soil	Date Extracted:	07/07/94
Preservation:	Cool	Date Analyzed:	07/19/94
Condition:	Intact		

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
2,4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol **	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg
Benzo(g,h,i)perylene	ND	1	mg/kg
Benzo(k)fluoranthene	ND	1	mg/kg
Benzoic Acid	ND	5	mg/kg

**EPA METHOD 8270  
HSL SEMI-VOLATILE COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client: WALSH &amp; ASSOCIATES

Sample ID: 1897 SP06

Date Reported:

07/25/94

Laboratory ID: B946408

Date Sampled:

06/30/94

Sample Matrix: Soil

Date Analyzed:

07/19/94

Parameter	Analytical Result	Detection Limit	Units
Benzyl Alcohol	ND	2	mg/kg
bis(2-Chloroethoxy)methane	ND	1	mg/kg
bis(2-Chloroethyl)ether	ND	1	mg/kg
bis(2-Chloroisopropyl)ether	ND	1	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5	mg/kg
Butylbenzylphthalate	ND	1	mg/kg
Chrysene	ND	1	mg/kg
Di-n-Butylphthalate	ND	5	mg/kg
Di-n-Octylphthalate	ND	1	mg/kg
Dibenz(a,h)anthracene	ND	1	mg/kg
Dibenzofuran	ND	1	mg/kg
Diethylphthalate	ND	1	mg/kg
Dimethylphthalate	ND	1	mg/kg
Fluoranthene	ND	1	mg/kg
Fluorene	ND	1	mg/kg
Hexachlorobenzene	ND	1	mg/kg
Hexachlorobutadiene	ND	2	mg/kg
Hexachlorocyclopentadiene	ND	1	mg/kg
Hexachloroethane	ND	2	mg/kg
Indeno(1,2,3-cd)pyrene	ND	1	mg/kg
Isophorone	ND	1	mg/kg
N-Nitrosodi-n-propylamine	ND	1	mg/kg
N-Nitrosodiphenylamine	ND	1	mg/kg
Naphthalene	ND	1	mg/kg
Nitrobenzene	ND	1	mg/kg
Pentachlorophenol	ND	5	mg/kg
Phenanthrene	ND	1	mg/kg
Phenol	ND	1	mg/kg
Pyrene	ND	1	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

\*\* - Compounds coelute by GC/MS.

B - Compound detected in Method Blank.

**EPA METHOD 8270  
TENTATIVELY IDENTIFIED COMPOUNDS  
BASE/NEUTRAL/ACID EXTRACTABLES**

Client:	WALSH & ASSOCIATES		
Sample ID:	1897 SP06	Date Reported:	07/25/94
Laboratory ID:	B946408	Date Sampled:	06/30/94
Sample Matrix:	Soil	Date Analyzed:	07/19/94

Tentative Identification	Retention Time (minutes)	Concentration	Units
-----------------------------	-----------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	60	25 - 121
Phenol-d6	79	24 - 113
Nitrobenzene-d5	72	23 - 120
2-Fluorobiphenyl	73	30 - 115
2,4,6-Tribromophenol	75	19 - 122
Terphenyl-d14	51	18 - 137

**Reference:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile  
Organics, Test Methods for Evaluating Solid Wastes, SW-846,  
United States Environmental Protection Agency, Third Edition,  
November 1986.

  
Analyst

  
Reviewed

## TOTAL METALS ANALYSIS

Client:	WALSH & ASSOCIATES	Date Reported:	07/26/94
Sample ID:	1897 SP06	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946408	Date Extracted:	07/11/94
Sample Matrix:	Soil	Date Analyzed:	07/20/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Result	Detection Level	Units
Aluminum	16000	200	mg/kg
Antimony	ND	20	mg/kg
Arsenic	ND	20	mg/kg
Barium	110	50	mg/kg
Beryllium	ND	2	mg/kg
Cadmium	3	2	mg/kg
Chromium	22	5	mg/kg
Cobalt	9	5	mg/kg
Copper	45	5	mg/kg
Iron	23000	200	mg/kg
Lead	380	20	mg/kg
Mercury	ND	0.5	mg/kg
Manganese	900	5	mg/kg
Molybdenum	ND	5	mg/kg
Nickel	17	5	mg/kg
Selenium	ND	20	mg/kg
Silver	ND	10	mg/kg
Thallium	ND	50	mg/kg
Titanium	200	5	mg/kg
Vanadium	29	10	mg/kg
Zinc	630	5	mg/kg
Gold	ND	200	mg/kg
Boron	ND	100	mg/kg
Calcium	3600	100	mg/kg
Potassium	2300	100	mg/kg
Magnesium	11000	100	mg/kg
Sodium	260	200	mg/kg
Phosphorous	730	200	mg/kg
Silicon	450	100	mg/kg
Yttrium	16	5	mg/kg

ND - Compound not detected at stated Detection Limit.

## References:

Method 3050: Acid digestion of Soils, Sediments, and Sludges.  
SW-846, September 1986.Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September 1986.  
Analyst  
Reviewed

## GENERAL PARAMETERS

Client: WALSH & ASSOCIATES  
Sample ID: 1897 SP06 Date Reported: 07/27/94  
Program ID: Rico Assay Bldg. 1897-010 Date Sampled: 06/30/94  
Laboratory ID: B946408 Date Received: 07/02/94  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Parameter	Analytical Result	Detection Level	Units
Cyanide, Total	ND	0.5	mg/kg
Sulfate	43	10	mg/kg

Sulfate result is suspect. Sample had a colloidal suspension that could not be filtered out. When acidified, the suspension precipitated. Filtration was performed; however, all precipitation was not filterable before addition of barium chloride.

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Appendix 9010A : Cyanide Extraction Procedure for Solids and Oils  
Method 9010 : Total and Amenable Cyanide  
Methods of Soil Analysis, No 9, American Society of Agronomy, 1965

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
HSL VOLATILE COMPOUNDS**

Client:	WALSH & ASSOCIATES	Date Reported:	07/22/94
Sample ID:	1897 C1	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946409	Date Extracted TCLP:	07/02/94
Sample Matrix:	Soil	Date Analyzed:	07/12/94
Preservation:	Cool	Date Extracted VOA:	NA
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,1-Dichloroethene	ND	0.02	0.7
1,2-Dichloroethane	ND	0.02	0.5
2-Butanone	ND	0.1	200
Benzene	ND	0.02	0.5
Carbon Tetrachloride	ND	0.02	0.5
Chlorobenzene	ND	0.02	100
Chloroform	ND	0.02	6
Tetrachloroethene (PCE)	ND	0.02	0.7
Trichloroethene (TCE)	ND	0.02	0.5
Vinyl Chloride	ND	0.02	0.2

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
TENTATIVELY IDENTIFIED COMPOUNDS**

Client: WALSH & ASSOCIATES  
Sample ID: 1897 CI  
Laboratory ID: B946409  
Sample Matrix: Soil

Date Reported: 07/22/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/12/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recovery	%
1,2-Dichloroethane-d4	101
Toluene-d8	101
Bromofluorobenzene	96

**References:**

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register,  
40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126,  
June 29, 1990.

  
Analyst  
Reviewed

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
HSL SEMI-VOLATILE COMPOUNDS**

Client:	WALSH & ASSOCIATES	Date Reported:	07/25/94
Sample ID:	1897 CI	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946409	Date Extracted-TCLP:	07/09/94
Sample Matrix:	Soil	Date Analyzed:	07/20/94
Preservation:	Cool	Date Extracted-BNA:	07/11/94
Condition:	Intact		

Parameter	Analytical Result (mg/L)	Detection Limit (mg/L)	Regulatory Limit (mg/L)
1,4-Dichlorobenzene	ND	0.01	7.5
Hexachloroethane	ND	0.02	3
Nitrobenzene	ND	0.01	2
Hexachloro-1,3-butadiene	ND	0.02	0.5
2,4,6-Trichlorophenol	ND	0.01	2
4,5-Trichlorophenol	ND	0.01	400
2,4-Dinitrotoluene	ND	0.01	0.13
Hexachlorobenzene	ND	0.01	0.13
Pentachlorophenol	ND	0.02	100
o-Cresol	ND	0.01	200 **
m & p-Cresol *	ND	0.01	200 **
Pyridine	ND	0.01	5

ND - Compound not detected at stated Detection Limit

B - Compound detected in Method Blank.

\* - Compounds coelute by GCMS.

\*\* - Regulatory Limit of combined Cresols.

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
TENTATIVELY IDENTIFIED COMPOUNDS**

Client: WALSH & ASSOCIATES  
Sample ID: 1897 CI  
Laboratory ID: B946409  
Sample Matrix: Soil

Date Reported: 07/25/94  
Date Sampled: 06/30/94  
Date Analyzed: 07/20/94

Parameter	Retention Time(min.)	Concentration	Units
-----------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming Relative Response Factor = 1.

**QUALITY CONTROL:**

Surrogate Recoveries	%
2-Fluorophenol	62
Phenol-d6	70
Nitrobenzene-d5	85
2-Fluorobiphenyl	88
2,4,6-Tribromophenol	106
Terphenyl-d14	114

**References:**

Method 8270, Gas Chromatography/Mass Spectrometry for Semi-Volatile  
Organics, Test Methods for Evaluating Solid Wastes, United States  
Environmental Protection Agency, December 1987.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal  
Register, 40 CFR 261-302, Part V, Environmental Protection Agency,  
Vol. 55, No. 126, June 29, 1990.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
ORGANOCHLORINE PESTICIDES**

Client: **WALSH & ASSOCIATES**  
Sample ID: **1897 CI**  
Project ID: **Rico Assay Bldg. 1897-010**  
Laboratory ID: **B946409**  
Sample Matrix: **Soil**  
Preservation: **Cool**  
Condition: **Intact**

Date Reported: **07/28/94**  
Date Sampled: **06/30/94**  
Date Received: **07/02/94**  
Date Extracted-Pest: **07/15/94**  
Date Analyzed: **07/19/94**

Parameter	Analytical Results	Detection Limit	Units
Endrin	ND	0.05	mg/L
Lindane	ND	0.05	mg/L
Heptachlor	ND	0.05	mg/L
Heptachlor Epoxide	ND	0.05	mg/L
Methoxychlor	ND	0.05	mg/L
Chlordane	ND	0.05	mg/L
Toxaphene	ND	0.05	mg/L

ND - Parameter Not Detected at Stated Detection Limit

**QUALITY CONTROL:**

Surrogate Recoveries: \_\_\_\_\_ %

Dibutyl Chlorendate 110%

References: Method 8081, Organochlorine Pesticides and PCB's, Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency SW-846, November 1990.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
CHLORINATED HERBICIDES**

Client:	WALSH & ASSOCIATES	Date Reported:	07/28/94
Sample ID:	1897 CI	Date Sampled:	06/30/94
Project ID:	Rico Assay Bldg. 1897-010	Date Received:	07/02/94
Laboratory ID:	B946409	Date Extracted:	07/14/94
Sample Matrix:	Soil	Date Analyzed:	07/18/94
Preservation:	Cool		
Condition:	Intact		

Parameter	Analytical Results	Detection Limit	Units
2,4,-D	ND	1	mg/L
Silvex	ND	0.1	mg/L

ND - Parameter Not Detected at Stated Detection Limit

References: Method 8150, Chlorinated Herbicides, Test Methods for Evaluating Solid Waste.  
United States Environmental Protection Agency, SW-846, Vol. IB, November, 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal  
Register, 40 CFR 261-302, Part V, Environmental Protection Agency.  
Vol. 55, No. 126, June 29, 1990.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

TOXICITY CHARACTERISTIC LEACHING PROCEDURE  
TRACE METAL CONCENTRATION

Client: WALSH & ASSOCIATES  
Sample ID: 1897 CI  
Project ID: Rico Assay Bldg.  
Laboratory ID: B946409  
Sample Matrix: Soil  
Preservation: Cool  
Condition: Intact

Date Reported: 07/20/94  
Date Sampled: 06/30/94  
Date Received: 07/02/94  
Date Extracted: 07/13/94  
Date Analyzed: 07/20/94

Parameter	Sample Result	PQL	Regulatory Level	Units
Arsenic	ND	0.2	5.0	mg/L
Barium	ND	5	100.0	mg/L
Cadmium	0.14	0.05	1.0	mg/L
Chromium	ND	0.05	5.0	mg/L
Lead	0.91	0.2	5.0	mg/L
Mercury	ND	0.02	0.2	mg/L
Selenium	ND	0.2	1.0	mg/L
Silver	ND	0.05	1.0	mg/L

ND-Parameter not detected at stated Practical Quantitation limit (PQL).

Reference: Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, September, 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September, 1990.

Method 7000: Atomic Absorption Spectroscopy  
SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

Analyst JP

Reviewed UB

## **QUALITY ASSURANCE / QUALITY CONTROL**

LAB QA/QC  
VOLATILE COMPOUNDS BY GC/MS  
METHOD BLANKDate Analyzed: 07/06/94  
Laboratory ID: 3MB-187A  
Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5	ug/L
Bromomethane	ND	5	ug/L
Vinyl Chloride	ND	5	ug/L
Chloroethane	ND	5	ug/L
Methylene Chloride	ND	20	ug/L
Acetone	ND	20	ug/L
Carbon Disulfide	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethene	ND	5	ug/L
Chloroform	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
2-Butanone	ND	20	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
Cyclohexane	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,4-Dioxane	ND	500	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Dibromochloromethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Benzene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Bromoform	ND	5	ug/L
4-Methyl-2-pentanone	ND	5	ug/L
2-Hexanone	ND	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L

## VOLATILE COMPOUNDS BY GC/MS

Date Analyzed: 07/06/94  
Laboratory ID: 3MB-187A  
Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Toluene	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Ethylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
m,p-Xylene	ND	5	ug/L
o-Xylene	ND	5	ug/L

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

LAB QA/QC  
VOLATILE COMPOUNDS BY GC/MS  
EXTRACTION BLANK

Date Analyzed: 07/06/94  
Laboratory ID: 3EB-187  
Sample Matrix: Soil  
Date Extracted: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	0.2	mg/kg
Bromomethane	ND	0.2	mg/kg
Vinyl Chloride	ND	0.2	mg/kg
Chloroethane	ND	0.2	mg/kg
Methylene Chloride	ND	1	mg/kg
Acetone	ND	1	mg/kg
Carbon Disulfide	ND	0.2	mg/kg
1,1-Dichloroethene	ND	0.2	mg/kg
1,1-Dichloroethane	ND	0.2	mg/kg
1,2-Dichloroethene	ND	0.2	mg/kg
Chloroform	ND	0.2	mg/kg
1,2-Dichloroethane	ND	0.2	mg/kg
2-Butanone	ND	1	mg/kg
1,1,1-Trichloroethane	ND	0.2	mg/kg
Carbon Tetrachloride	ND	0.2	mg/kg
Bromodichloromethane	ND	0.2	mg/kg
1,2-Dichloropropane	ND	0.2	mg/kg
cis-1,3-Dichloropropene	ND	0.2	mg/kg
Trichloroethene	ND	0.2	mg/kg
Dibromochloromethane	ND	0.2	mg/kg
1,1,2-Trichloroethane	ND	0.2	mg/kg
Benzene	ND	0.2	mg/kg
trans-1,3-Dichloropropene	ND	0.2	mg/kg
Bromoform	ND	0.2	mg/kg
4-Methyl-2-pentanone	ND	0.2	mg/kg
2-Hexanone	ND	0.2	mg/kg
Tetrachloroethene	ND	0.2	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.2	mg/kg

## VOLATILE COMPOUNDS BY GC/MS

Date Analyzed: 07/06/94  
Laboratory ID: 3EB-187  
Sample Matrix: Soil  
Date Extracted: 07/06/94

Parameter	Analytical Result	Detection Limit	Units
Toluene	ND	0.2	mg/kg
Chlorobenzene	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
Styrene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

TENTATIVELY IDENTIFIED COMPOUNDS  
EXTRACTION BLANK ANALYSIS

Date Analyzed: 07/06/94  
Laboratory ID: 3EB-187  
Sample Matrix: Soil  
Date Extracted: 07/06/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

known concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%	Soil QC Limits
1,2-Dichloroethane-d4	93	70 - 121
Toluene-d8	103	81 - 117
Bromofluorobenzene	99	74 - 121

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**LAB QA/QC**  
**VOLATILE COMPOUNDS BY GC/MS**  
**METHOD BLANK**

Date Analyzed: 07/12/94  
 Laboratory ID: 3MB-193A  
 Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Chloromethane	ND	5	ug/L
Bromomethane	ND	5	ug/L
Vinyl Chloride	ND	5	ug/L
Chloroethane	ND	5	ug/L
Methylene Chloride	ND	20	ug/L
Acetone	ND	20	ug/L
Carbon Disulfide	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethene	ND	5	ug/L
Chloroform	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
2-Butanone	ND	20	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
Cyclohexane	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,4-Dioxane	ND	500	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Dibromochloromethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Benzene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Bromoform	ND	5	ug/L
4-Methyl-2-pentanone	ND	5	ug/L
2-Hexanone	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L

## VOLATILE COMPOUNDS BY GC/MS

Date Analyzed: 07/12/94  
Laboratory ID: 3MB-193A  
Sample Matrix: Water

Parameter	Analytical Result	Detection Limit	Units
Toluene	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Ethylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
m,p-Xylene	ND	5	ug/L
o-Xylene	ND	5	ug/L

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

TENTATIVELY IDENTIFIED COMPOUNDS  
METHOD BLANK ANALYSIS

Date Analyzed: 07/12/94  
Laboratory ID: 3MB-193A  
Sample Matrix: Water

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.


## QUALITY CONTROL:

Surrogate Recovery	%	Water QC Limits
1,2-Dichloroethane-d4	100	76 - 114
Toluene-d8	103	88 - 110
Bromofluorobenzene	97	86 - 115

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed

**LAB QA/QC  
VOLATILE COMPOUNDS BY GC/MS  
TCLP BLANK**

Date Analyzed: 07/21/94  
Laboratory ID: 3TB-202A  
Sample Matrix: Extraction fluid  
Date Extracted: 07/20/94

Parameter	Analytical Result	Detection Limit	Units
1,1-Dichloroethene	ND	0.005	mg/L
1,2-Dichloroethane	ND	0.005	mg/L
2-Butanone	ND	0.02	mg/L
Benzene	ND	0.005	mg/L
Carbon Tetrachloride	ND	0.005	mg/L
Chlorobenzene	ND	0.005	mg/L
Chloroform	ND	0.005	mg/L
Tetrachloroethene	ND	0.005	mg/L
Trichloroethene	ND	0.005	mg/L
Vinyl Chloride	ND	0.005	mg/L

ND - Compound not detected at stated Detection Limit.

J - Meets identification criteria, below Detection Limit.

B - Compound detected in method blank.

## TENTATIVELY IDENTIFIED COMPOUNDS

Date Analyzed: 07/21/94  
Laboratory ID: 3TB-202A  
Sample Matrix: Extraction fluid  
Date Extracted: 07/20/94

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentrations calculated assuming a Relative Response Factor = 1.

## QUALITY CONTROL:

Surrogate Recovery	%
1,2-Dichloroethane-d4	91
Toluene-d8	98
Bromofluorobenzene	100

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst  
Reviewed

1B QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK

Date Analyzed: 07/19/94  
Laboratory ID: MB-192  
Sample Matrix: Water  
Date Extracted: 07/11/94

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
1-Methylnaphthalene	ND	10	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L
2,4,6-Trichlorophenol	ND	10	ug/L
2,4-Dichlorophenol	ND	10	ug/L
2,4-Dimethylphenol	ND	10	ug/L
2,4-Dinitrophenol	ND	50	ug/L
2,4-Dinitrotoluene	ND	10	ug/L
3-Dinitrotoluene	ND	10	ug/L
2-Chloronaphthalene	ND	10	ug/L
2-Chlorophenol	ND	10	ug/L
2-Methylnaphthalene	ND	10	ug/L
2-Methylphenol	ND	10	ug/L
2-Nitroaniline	ND	50	ug/L
2-Nitrophenol	ND	10	ug/L
3,3'-Dichlorobenzidine	ND	20	ug/L
3-Methylphenol/4-Methylphenol *	ND	10	ug/L
3-Nitroaniline	ND	50	ug/L
4,6-Dinitro-2-methylphenol	ND	50	ug/L
4-Bromophenyl-phenylether	ND	10	ug/L
4-Chloro-3-methylphenol	ND	20	ug/L
4-Chloroaniline	ND	20	ug/L
4-Chlorophenyl-phenylether	ND	10	ug/L
4-Nitroaniline	ND	20	ug/L
4-Nitrophenol	ND	50	ug/L
6-Methyl chrysene	ND	10	ug/L
7,12-Dimethylbenz(a)anthracene	ND	10	ug/L
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Anthracene	ND	10	ug/L
Benzenethiol	ND	10	ug/L
Benzo(a)anthracene	ND	10	ug/L
Benzo(a)pyrene	ND	10	ug/L
Benzo(b)fluoranthene	ND	10	ug/L

LAB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK

Date Analyzed: 07/19/94  
Laboratory ID: 07/10/00  
Sample Matrix: Water  
Date Extracted: 07/11/94

Parameter	Analytical Result	Detection Limit	Units
Benzo(g,h,i)perylene	ND	10	ug/L
Benzo(k)fluoranthene	ND	10	ug/L
Benzoic Acid	ND	50	ug/L
Benzyl Alcohol	ND	20	ug/L
bis(2-Chloroethoxy)methane	ND	10	ug/L
bis(2-Chloroethyl)ether	ND	10	ug/L
bis(2-Chloroisopropyl)ether	ND	10	ug/L
bis(2-Ethylhexyl)phthalate	ND	10	ug/L
Butylbenzylphthalate	ND	10	ug/L
Chrysene	ND	10	ug/L
di-n-Butylphthalate	ND	10	ug/L
n-Octylphthalate	ND	10	ug/L
benz(a,h)acridine	ND	10	ug/L
Dibenz(a,h)anthracene	ND	10	ug/L
Dibenzofuran	ND	10	ug/L
Diethylphthalate	ND	10	ug/L
Dimethylphthalate	ND	10	ug/L
Fluoranthene	ND	10	ug/L
Fluorene	ND	10	ug/L
Hexachlorobenzene	ND	10	ug/L
Hexachlorobutadiene	ND	20	ug/L
Hexachlorocyclopentadiene	ND	10	ug/L
Hexachloroethane	ND	20	ug/L
Indene	ND	10	ug/L
Indeno(1,2,3-cd)pyrene	ND	10	ug/L
Isophorone	ND	10	ug/L
N-Nitrosodi-n-propylamine	ND	10	ug/L
N-Nitrosodiphenylamine	ND	10	ug/L
Naphthalene	ND	10	ug/L
Nitrobenzene	ND	10	ug/L
Pentachlorophenol	ND	50	ug/L
Phenanthrene	ND	10	ug/L
Phenol	ND	10	ug/L
Pyrene	ND	10	ug/L
Pyridine	ND	10	ug/L
Quinoline	ND	10	ug/L

ND - Compound not detected at stated Detection Limits.

\* - Compounds Coelute by GC/MS.

AB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
METHOD BLANK  
TENTATIVELY IDENTIFIED COMPOUNDS

Date Analyzed: 07/19/94  
Laboratory ID: 07/10/00  
Sample Matrix: Water  
Date Extracted: 07/11/94

Tentatively Identification	Retention Time (min.)	Concentration	Units
-------------------------------	--------------------------	---------------	-------

No additional compounds found at reportable levels.

Unknown concentration calculated assuming Relative Response Factor = 1.

QUALITY CONTROL:


Surrogate Recoveries	%	Water QC Limits
2-Fluorophenol	55	21 - 100
Phenol-d6	60	10 - 94
Nitrobenzene-d5	73	35 - 114
2-Fluorobiphenyl	65	43 - 116
2,4,6-Tribromophenol	69	10 - 123
Terphenyl-d14	52	33 - 141

Reference:

Method 8270, Gas Chromatography/Mass Spectrometry for  
Semivolatile Organics, Test Methods for Evaluating Solid Wastes,  
SW846, USEPA, Third Edition, November 1986.

USEPA Contract Lab Program, Statement of Work for Organic  
Analysis, Multi-Media, Multi-Concentration, OLM01.0, December 1990.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**LAB QA/QC**  
**SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS**  
**METHOD BLANK**

Date Analyzed: 07/18/94  
 Laboratory ID: SMB-188  
 Sample Matrix: Soil  
 Date Extracted: 07/07/94

Parameter	Analytical Result	Detection Limit	Units
1,2,4-Trichlorobenzene	ND	1	mg/kg
1,2-Dichlorobenzene	ND	1	mg/kg
1,3-Dichlorobenzene	ND	1	mg/kg
1,4-Dichlorobenzene	ND	1	mg/kg
1-Methylnaphthalene	ND	1	mg/kg
2,4,5-Trichlorophenol	ND	1	mg/kg
2,4,6-Trichlorophenol	ND	1	mg/kg
2,4-Dichlorophenol	ND	1	mg/kg
2,4-Dimethylphenol	ND	1	mg/kg
2,4-Dinitrophenol	ND	5	mg/kg
4-Dinitrotoluene	ND	1	mg/kg
2,6-Dinitrotoluene	ND	1	mg/kg
2-Chloronaphthalene	ND	1	mg/kg
2-Chlorophenol	ND	1	mg/kg
2-Methylnaphthalene	ND	1	mg/kg
2-Methylphenol	ND	1	mg/kg
2-Nitroaniline	ND	5	mg/kg
2-Nitrophenol	ND	1	mg/kg
3,3'-Dichlorobenzidine	ND	2	mg/kg
3-Methylphenol/4-Methylphenol *	ND	1	mg/kg
3-Nitroaniline	ND	5	mg/kg
4,6-Dinitro-2-methylphenol	ND	5	mg/kg
4-Bromophenyl-phenylether	ND	1	mg/kg
4-Chloro-3-methylphenol	ND	2	mg/kg
4-Chloroaniline	ND	2	mg/kg
4-Chlorophenyl-phenylether	ND	1	mg/kg
4-Nitroaniline	ND	2	mg/kg
4-Nitrophenol	ND	5	mg/kg
6-Methyl chrysene	ND	1	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	1	mg/kg
Acenaphthene	ND	1	mg/kg
Acenaphthylene	ND	1	mg/kg
Anthracene	ND	1	mg/kg
Benzenethiol	ND	1	mg/kg
Benzo(a)anthracene	ND	1	mg/kg
Benzo(a)pyrene	ND	1	mg/kg
Benzo(b)fluoranthene	ND	1	mg/kg

## LAB QA/QC

TOXICITY CHARACTERISTIC LEACHING PROCEDURE - CHLORINATED HERBICIDES  
METHOD BLANK

Date Analyzed: 07/18/94  
Laboratory ID: MB-195  
Sample Matrix: Water

Parameter	Analytical Results	Detection Limits	Units
2,4-D	ND	0.05	mg/L
2,4,5-TP (Silvex)	ND	0.05	mg/L

All quantities are expressed as total nanograms.

## QUALITY CONTROL

Surrogate Recoveries:	%
DCAA	67

## References:

Method 515.1, Determination of Chlorinated Acids in Water by Gas Chromatography  
with an Electron Capture Detector, EPA/600/4-88/039, December 1988.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
EPA METHOD 8081  
Method BlankDate Analyzed: 07/25/94  
Laboratory ID: MB202  
Sample Matrix: Water

Parameter	Analytical Results	Detection Limit	Units
Endrin	ND	0.0005	mg/L
Lindane	ND	0.0005	mg/L
Heptachlor	ND	0.0005	mg/L
Heptachlor Epoxide	ND	0.0005	mg/L
*Methoxychlor	ND	0.0005	mg/L
lordane	ND	0.005	mg/L
Toxaphene	ND	0.005	mg/L

ND - Parameter Not Detected at Stated Detection Limit

References: Method 8081, Organochlorine Pesticides and PCB's, Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency SW-846, November 1990.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
METHOD BLANK

Date Analyzed: 07/20/94  
Laboratory ID: TMB 94-24  
Sample Matrix: Extract

Parameter	Sample Result	PQL	Regulatory Level	Units
Arsenic	ND	0.2	5.0	mg/L
Barium	ND	5	100.0	mg/L
Cadmium	ND	0.05	1.0	mg/L
Chromium	ND	0.05	5.0	mg/L
Lead	ND	0.2	5.0	mg/L
Mercury	ND	0.02	0.2	mg/L
Selenium	ND	0.2	1.0	mg/L
Silver	ND	0.05	1.0	mg/L

ND-Parameter not detected at stated Practical Quantitation limit (PQL).

Reference: Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, September, 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September, 1990.

Method 7000: Atomic Absorption Spectroscopy  
SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

Analyst HPK

Reviewed USG

LAB QA/QC  
9010 TOTAL CYANIDE  
QUALITY CONTROL SUMMARY

Date Analyzed: 07/27/94  
Laboratory ID: B946403-6408;6778  
Sample Matrix: Water

Sample ID	Expected ug/L	Result ug/L	Recovery %
CBS9410	20	23	115.0
CMB9410	0	0	NA

NA - Not Applicable

Reference: SW-846, United States Environmental Protection Agency, Nov. 1986  
Method 9010: Total Cyanide

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
PURGEABLE ORGANIC COMPOUNDS  
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 07/06/94  
Laboratory ID: 3MSD6406  
Sample Matrix: Soil  
Date Extracted: 7/6/94

## ORIGINAL SAMPLE PARAMETERS


Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	MS Conc. (mg/kg)	MS Recovery (%)	QC Limits (% Rec.)
1,1-Dichloroethene	2	0	1.4	66	59-172
Trichloroethene	2	0	1.6	80	62-137
Benzene	2	0	1.6	80	66-142
Toluene	2	0	1.7	81	59-139
Chlorobenzene	2	0	1.8	90	60-133

## DUPLICATE SAMPLE PARAMETERS

Parameter	Spike Added (mg/kg)	MSD Conc. (mg/kg)	MSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
1,1-Dichloroethene	2	1.3	61	8	22	59-172
Trichloroethene	2	1.6	80	0	24	62-137
Benzene	2	1.6	80	11	21	66-142
Toluene	2	1.7	81	0	21	59-139
Chlorobenzene	2	1.8	90	0	21	60-133

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.

  
Analyst

  
Reviewed

LAB QA/QC  
PURGEABLE ORGANIC COMPOUNDS  
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARYDate Analyzed: 07/12/94  
Laboratory ID: 3MSD6533  
Sample Matrix: Water

## ORIGINAL SAMPLE PARAMETERS

Parameter	Spike Added (ug/L)	Sample Conc. (ug/L)	MS Conc. (ug/L)	MS Recovery (%)	QC Limits (% Rec.)
1,1-Dichloroethene	100	0	75	75	61-145
Trichloroethene	100	0	81	81	71-120
Benzene	100	0	83	83	76-127
Toluene	100	0	87	87	71-127
Chlorobenzene	100	0	86	86	75-130

## DUPLICATE SAMPLE PARAMETERS

Parameter	Spike Added (ug/L)	MSD Conc. (ug/L)	MSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
1,1-Dichloroethene	100	74	74	1	14	61-145
Trichloroethene	100	78	78	4	14	71-120
Benzene	100	81	81	2	11	76-127
Toluene	100	83	83	5	13	71-127
Chlorobenzene	100	83	83	4	13	75-130

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.  
Analyst  
Reviewed

**LAB QA/QC  
PURGEABLE ORGANIC COMPOUNDS BY GC/MS - TCLP  
MATRIX SPIKE SUMMARY**

Date Analyzed: 07/08/94  
Laboratory ID: 3TMS5970  
Sample Matrix: Water  
Date Extracted: 7/7/94

Parameter	Spike Added mg/L	Sample Concentration mg/L	Matrix Spike Concentration mg/L	Matrix Spike Recovery (%)
Vinyl Chloride	0.1	0	0.090	90
1,1-Dichloroethene	0.1	0	0.090	90
1,2-Dichloroethane	0.1	0	0.091	91
Chloroform	0.1	0	0.091	91
Carbon Tetrachloride	0.1	0	0.092	92
Trichloroethene	0.1	0	0.092	92
nzene	0.1	0	0.093	93
tetrachloroethene	0.1	0	0.099	99
Chlorobenzene	0.1	0	0.10	100
Methyl Ethyl Ketone	0.1	0	0.049	49

**QUALITY CONTROL:**

Surrogate Recovery	%
1,2-Dichloroethane-d4	97
Toluene-d8	104
Bromofluorobenzene	97

**References:**

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register,  
40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126,  
June 29, 1990.

  
Analyst  
Reviewed

## LAB QA/QC

TOXICITY CHARACTERISTIC LEACHING PROCEDURE - CHLORINATED HERBICIDES  
BLANK SPIKE

Date Analyzed: 07/18/94

Laboratory ID: BS-195

Sample Matrix: Water

Parameter	Found Results (mg/L)	Expected Results (mg/L)	Percent Recovery
2,4-D	0.00077	0.0011	70%
2,4,5-TP (Silvex)	0.00063	0.0011	57%

## QUALITY CONTROL

Surrogate Recoveries:	%
DCAA	88

## References:

Method 515.1, Determination of Chlorinated Acids in Water by Gas Chromatography  
with an Electron Capture Detector, EPA/600/4-88/039, December 1988.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

**AB QA/QC**  
**EPA METHOD 8081**  
**Blank Spike**

Date Analyzed: 07/25/94  
Laboratory ID: BS202  
Sample Matrix: Water

Parameter	Expected Results (mg/L)	Found Results (mg/L)	Percent Recovery
Endrin	0.0004	0.00043	107%
Heptachlor	0.0004	0.00019	47%
Heptachlor Epoxide	0.0004	0.00033	82%

**QUALITY CONTROL**

Surrogate Recoveries: \_\_\_\_\_ %

Dibutyl Chlorodanate 111%

References: Method 8081, Organochlorine Pesticides and PCB's, Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency SW-846, November 1990.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
MATRIX SPIKEDate Analyzed: 07/20/94  
Laboratory ID: B946409  
Sample Matrix: Soil

Parameter	Spike Added	Sample Result	Spiked Result	MS % Recovery	PQL	Units
Arsenic	2.5	ND	2.5	100	0.2	mg/L
Barium	5.0	ND	4.5	89	5	mg/L
Cadmium	0.5	0.14	0.6	94	0.05	mg/L
Chromium	2.0	ND	1.9	97	0.05	mg/L
Lead	2.0	0.91	2.8	97	0.2	mg/L
Mercury	0.2	ND	0.2	96	0.02	mg/L
Selenium	2.5	ND	2.5	99	0.2	mg/L
Silver	0.05	ND	0.04	80	0.05	mg/L

ND-Parameter not detected at stated Practical Quantitation limit (PQL).

Reference: Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, September, 1986.Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September, 1990.Method 7000: Atomic Absorption Spectroscopy  
SW-846, September 1986.Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.Analyst MBReviewed WS

LAB QA/QC  
TRACE METALS - TCLP  
DUPLICATE SUMMARY

Date Analyzed: 07/20/94  
Laboratory ID: 8946409  
Sample Matrix: Soil

Parameter	Sample Result	Duplicate Sample Result	RPD %	PQL	Units
Arsenic	ND	ND		0.2	mg/L
Barium	ND	ND		5	mg/L
Cadmium	0.14	0.14		0.05	mg/L
Chromium	ND	ND		0.05	mg/L
Lead	0.91	0.91		0.2	mg/L
Mercury	ND	ND		0.02	mg/L
Selenium	ND	ND		0.2	mg/L
Silver	ND	ND		0.05	mg/L

ND-Parameter not detected at stated Practical Quantitation limit (PQL).

Reference: Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, September, 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, September, 1990.

Method 7000: Atomic Absorption Spectroscopy  
SW-846, September 1986.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, September 1986.

Analyst WKE

Reviewed WKE

**LAB QA/QC  
SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS  
BLANK SPIKE**

Date Analyzed: 07/18/94  
Laboratory ID: SBS - 188  
Sample Matrix: Soil  
Date Extracted: 07/07/94

Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	MS Conc. (mg/kg)	MS Recovery (%)	QC Limits (% Rec.)
Phenol	200	0	127	64	26 - 90
2-Chlorophenol	200	0	115	58	25 - 102
1,4-Dichlorobenzene	100	0	62	62	28 - 104
n-Nitroso-di-n-propylamine	100	0	72	72	41-126
1,2,4-Trichlorobenzene	100	0	62	62	38 - 107
4-Chloro-3-methylphenol	200	0	117	59	26 - 103
Acenaphthene	100	0	67	67	31 - 137
Nitrophenol	200	0	146	73	11-114
2,4-Dinitrotoluene	100	0	88	88	28 - 89
Pentachlorophenol	200	0	124	62	17 - 109
Pyrene	100	0	55	55	35 - 142

**QUALITY CONTROL:**

Surrogate Recoveries	%	Soil QC Limits
2-Fluorophenol	71	25 - 121
Phenol-d5	89	24 - 113
Nitrobenzene-d5	73	23 - 120
2-Fluorobiphenyl	73	30 - 115
2,4,6-Tribromophenol	90	19 - 122
p-Terphenyl	58	18 - 137

Spike Recovery: 0 out of 11 outside QC limits.

  
Analyst  
Reviewed

## LAB QA/QC

## SEMI-VOLATILE ORGANIC COMPOUNDS BY GC/MS

## MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 07/21/94  
Laboratory ID: TBS-192  
Sample Matrix: Water  
Date Extracted: 07/11/94

Parameter	Spike Added (ug/L)	Sample Concentration (ug/L)	Matrix Spike Concentration (ug/L)	Matrix Spike Recovery (%)
1,4-Dichlorobenzene	100	0	64	64
Hexachloroethane	100	0	64	64
Nitrobenzene	100	0	85	85
Hexachlorobutadiene	100	0	68	68
4,6-Trichlorophenol	100	0	78	78
2,4,5-Trichlorophenol	100	0	80	80
2,4-Dinitrotoluene	100	0	103	103
Hexachlorobenzene	100	0	77	77
Pentachlorophenol	100	0	84	84
o-Cresol	100	0	78	78
m,p-Cresol	200	0	138	69
Pyridine	100	0	55	55

All values are total nanograms.

## Reference:

Method 8270. Semivolatile Organics - GC/MS, Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency, SW-846, Vol. IB, November 1986.

Toxicity Characteristic Leaching Procedure, Final Rule, Federal Register, 40 CFR 261-302, Part V, Environmental Protection Agency, Vol. 55, No. 126, June 29, 1990.

  
Analyst

  
Reviewed

# CHAIN OF CUSTODY RECORD

Client/Project Name			Project Location		ANALYSES / PARAMETERS								
Sampler: (Signature)			Chain of Custody Tape No.		No. of Containers	VOA	SVOA	ICP Metals	Hg	Cyanide	Sulfate	Full TCLP	Remarks
Sample No./ Identification	Date	Time	Lab Number	Matrix									
1897 SP01	7/30/94	1120	B946403	Soil	2	✓	✓	✓	✓				2-4 oz ea.
1897 SP02		1147	6404		2	✓	✓	✓	✓				
1897 SP03		1216	6405		2	✓	✓	✓	✓				
1897 SP04		1300	6406		2	✓	✓	✓	✓				
1897 SP05		1316	6407		2	✓	✓	✓	✓				
1897 SP06		1325	6408		2	✓	✓	✓	✓				
1897 C1		1440	6409		1							✓	1 liter
													7.1°C
													ident. elapsed
Relinquished by: (Signature)			Date	Time	Received by: (Signature)			Date	Time				
			7/1/94	1415	Tim W. Frocher			7/1	17:00				
Relinquished by: (Signature)			Date	Time	Received by: (Signature)			Date	Time				
Relinquished by: (Signature)			Date	Time	Received by laboratory: (Signature)			Date	Time				

**Inter-Mountain Laboratories, Inc.**

☐ 1633 Terra Avenue  
Sheridan, Wyoming 82901  
Telephone (307) 672-8945

☐ 1714 Phillips Circle  
Gillette, Wyoming 82716  
Telephone (307) 682-8945

☐ 2606 West Main Street  
Farmington, NM 87401  
Telephone (505) 328-4737

☒ 1160 Research Dr.  
Bozeman, Montana 59715  
Telephone (406) 588-8450

☐ 11183 SH 30  
College Station, TX 77845  
Telephone (409) 776-8945

☐ 3304 Longmire Drive  
College Station, TX 77845  
Telephone (409) 774-4999

18814

*PRIVILEGED AND CONFIDENTIAL*

**HIGHWAY DEPARTMENT ANALYTICAL DATA**

### **CASE NARRATIVE**

On August 18, 1994, three samples were received for analysis at Inter-Mountain Laboratories, Bozeman, Montana. The chain of custody form requested analysis for Toxicity Characteristic Leaching Procedure Parameters, metals only, and also BTEX/TVH(GRO), and TEH(DRO). Client name / Project name was listed as Walsh & Associates, Inc. / Rico CDOT.

Detectable amounts of targeted compounds were present in the samples.

The Toxicity Characteristic Leaching Procedure methodology used is outlined in the Federal Register, 40 CFR 261, Vol. 55, No. 126, June 29, 1990. Results are reported in mass per unit volume of leachate (mg/L).

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges.

  
Wynn Sudtelgte  
IML-Bozeman

0826wa

EPA METHOD 8020  
AROMATIC VOLATILE COMPOUNDS  
BETX

Client: WALSH &amp; ASSOCIATES, INC.

Sample ID: DOT 1

Project ID: Rico CDOT

Laboratory ID: B947492

Sample Matrix: Soil

Date Reported: 08/22/94

Date Sampled: 08/17/94

Date Received: 08/18/94

Date Extracted: 08/18/94

Date Analyzed: 08/19/94

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
n,p-Xylene	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

## Reference:

Method 8021, Volatile Organic Compounds, Test Methods for Evaluating  
Solid Waste, Physical/Chemical Methods, United States Environmental  
Protection Agency, SW-846, Volume 1B, December 1987.

Analysis Method: Gas Chromatograph / Purge and Trap / PID

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

## GASOLINE RANGE ORGANICS - GRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 1  
Project ID: Rico CDOT  
Laboratory ID: B947492  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/18/94  
Date Analyzed: 08/18/94

Parameter	Result	PQL	Units
Gasoline Range Organics	14	10	mg/kg
Gasoline Range Organics as Gasoline	14	10	mg/kg
Total Purgeable Hydrocarbons	14	10	mg/kg

## QUALITY CONTROL:

Surrogate Recovery	%
Bromofluorobenzene	121

ND - Not detected at stated Practical Quantitation Limit (PQL).

## Reference:

GRO - USEPA Method for Determination of Gasoline Range Organics, Revision 5, February 1992.

WTPH-G Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

3.4  
Analyst

us  
Reviewed

## DIESEL RANGE ORGANICS - DRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 1  
Project ID: Rico CDOT  
Lab ID: B947492  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/19/94  
Date Analyzed: 08/22/94

Parameter	Result	PQL	Units
Diesel Range Organics	23	5	mg/kg
Diesel Range Organics as Diesel	23	5	mg/kg
Total Extractable Hydrocarbons	28	5	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 2, February 1992.

WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

Analyst: *Sharon B. H.*

Reviewed: *1/1*

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
TRACE METAL CONCENTRATION**

Client: **WALSH & ASSOCIATES, INC.**  
Sample ID: **DOT 1**  
Project ID: **Rico CDOT**  
Laboratory ID: **B947492**  
Sample Matrix: **Soil**

Date Reported: **08/26/94**  
Date Sampled: **08/17/94**  
Date Received: **08/18/94**  
Date Extracted TCLP: **08/23/94**  
Date Analyzed: **08/25/94**

Parameter	Analytical Result (mg/L)	Detection Level (mg/L)	Regulatory Level (mg/L)
Arsenic	ND	0.2	5.0
Barium	0.8	0.5	100
Cadmium	0.08	0.05	1.0
Chromium	ND	0.05	5.0
Lead	ND	0.5	5.0
Mercury	ND	0.02	0.2
Selenium	ND	0.2	1.0
Silver	ND	0.05	1.0

ND-Parameter not detected at stated detection level.


**References:**

Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8020  
AROMATIC VOLATILE COMPOUNDS  
BETX

Client:	WALSH & ASSOCIATES, INC.	Date Reported:	08.22.94
Sample ID:	DOT 2	Date Sampled:	08.17.94
Project ID:	Rico CDOT	Date Received:	08.18.94
Laboratory ID:	B947493	Date Extracted:	08.18.94
Sample Matrix:	Soil	Date Analyzed:	08.19.94

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	0.2	mg kg
Toluene	ND	0.2	mg kg
Ethylbenzene	ND	0.2	mg kg
n,p-Xylene	ND	0.2	mg kg
o-Xylene	ND	0.2	mg kg

ND - Compound not detected at stated Detection Limit.

## Reference:

Method 8021, Volatile Organic Compounds, Test Methods for Evaluating  
Solid Waste, Physical/Chemical Methods, United States Environmental  
Protection Agency, SW-846, Volume IB, December 1987.

Analysis Method: Gas Chromatograph / Purge and Trap / PID

SBH  
AnalystWS  
Reviewed

## GASOLINE RANGE ORGANICS - GRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 2  
Project ID: Rico CDOT  
Laboratory ID: B947493  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/18/94  
Date Analyzed: 08/18/94

Parameter	Result	PQL	Units
Gasoline Range Organics	12	10	mg/kg
Gasoline Range Organics as Gasoline	12	10	mg/kg
Total Purgeable Hydrocarbons	13	10	mg/kg

## QUALITY CONTROL:

Surrogate Recovery	%
Bromofluorobenzene	120

ND - Not detected at stated Practical Quantitation Limit (PQL).

## Reference:

GRO - USEPA Method for Determination of Gasoline Range Organics, Revision 5, February 1992.

WTPH-G Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology,  
Revision 3, October 1991.

                      
Analyst

                      
Reviewed

## DIESEL RANGE ORGANICS - DRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 2  
Project ID: Rico CDOT  
Lab ID: B947493  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/19/94  
Date Analyzed: 08/22/94

Parameter	Result	PQL	Units
Diesel Range Organics	ND	5	mg/kg
Diesel Range Organics as Diesel	ND	5	mg/kg
Total Extractable Hydrocarbons	ND	5	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics, Revision 2, February 1992.

WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

Reviewed

*WJ*

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
TRACE METAL CONCENTRATION**

Client: **WALSH & ASSOCIATES, INC.**  
Sample ID: **DOT 2**  
Project ID: **Rico CDOT**  
Laboratory ID: **B947493**  
Sample Matrix: **Soil**

Date Reported: **08/26/94**  
Date Sampled: **08/17/94**  
Date Received: **08/18/94**  
Date Extracted TCLP: **08/23/94**  
Date Analyzed: **08/25/94**

Parameter	Analytical Result (mg/L)	Detection Level (mg/L)	Regulatory Level (mg/L)
Arsenic	ND	0.2	5.0
Barium	1.2	0.5	100
Cadmium	0.05	0.05	1.0
Chromium	ND	0.05	5.0
Lead	ND	0.5	5.0
Mercury	ND	0.02	0.2
Selenium	ND	0.2	1.0
Silver	ND	0.05	1.0

ND-Parameter not detected at stated detection level.

**References:**


Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8020  
AROMATIC VOLATILE COMPOUNDS  
BETX

Client: WALSH &amp; ASSOCIATES, INC.

Sample ID: DOT 3

Project ID: Rico CDOT

Laboratory ID: B947494

Sample Matrix: Soil

Date Reported: 08/22/94

Date Sampled: 08/17/94

Date Received: 08/18/94

Date Extracted: 08/18/94

Date Analyzed: 08/19/94

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	0.2	mg/kg
Toluene	1.1	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
n,p-Xylene	1.3	0.2	mg/kg
o-Xylene	1.2	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

## Reference:

Method 8021, Volatile Organic Compounds, Test Methods for Evaluating  
Solid Waste, Physical/Chemical Methods, United States Environmental  
Protection Agency, SW-846, Volume 1B, December 1987.

Analysis Method: Gas Chromatograph / Purge and Trap / PID

36  
Analystus  
Reviewed

## GASOLINE RANGE ORGANICS - GRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 3  
Project ID: Rico CDOT  
Laboratory ID: B947494  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/18/94  
Date Analyzed: 08/18/94

Parameter	Result	PQL	Units
Gasoline Range Organics	120	10	mg/kg
Gasoline Range Organics as Gasoline	120	10	mg/kg
Total Purgeable Hydrocarbons	810	10	mg/kg

## QUALITY CONTROL:

Surrogate Recovery	%
** Bromofluorobenzene	165

ND - Not detected at stated Practical Quantitation Limit (PQL).

\*\* - Coelution Matrix Effect.

## Reference:

GRO - USEPA Method for Determination of Gasoline Range Organics, Revision 5, February 1992.

WTPH-G Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

34  
Analyst

WB  
Reviewed

## DIESEL RANGE ORGANICS - DRO

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 3  
Project ID: Rico CDOT  
Lab ID: B947494  
Matrix: Soil

Date Reported: 08/24/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted: 08/19/94  
Date Analyzed: 08/20/94

Parameter	Result	PQL	Units
Diesel Range Organics	600	5	mg/kg
Diesel Range Organics as Diesel	600	5	mg/kg
Total Extractable Hydrocarbons	600	5	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 2, February 1992.

WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

Reviewed us

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE - TCLP  
TRACE METAL CONCENTRATION**

Client: WALSH & ASSOCIATES, INC.  
Sample ID: DOT 3  
Project ID: Rico CDOT  
Laboratory ID: B947494  
Sample Matrix: Soil

Date Reported: 08/26/94  
Date Sampled: 08/17/94  
Date Received: 08/18/94  
Date Extracted TCLP: 08/23/94  
Date Analyzed: 08/25/94

Parameter	Analytical Result (mg/L)	Detection Level (mg/L)	Regulatory Level (mg/L)
Arsenic	ND	0.2	5.0
Barium	2	0.5	100
Cadmium	0.07	0.05	1.0
Chromium	ND	0.05	5.0
Lead	1.7	0.5	5.0
Mercury	ND	0.02	0.2
Selenium	ND	0.2	1.0
Silver	ND	0.05	1.0

ND-Parameter not detected at stated detection level.

**References:**

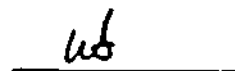
Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

EPA METHOD 8020  
AROMATIC VOLATILE COMPOUNDS  
BETX

Client:	WALSH & ASSOCIATES, INC.		
Sample ID:	Trip Blank	Date Reported:	08/22/94
Project ID:	Rico CDOT	Date Sampled:	08.15.94
Laboratory ID:	B947495	Date Received:	08.18.94
Sample Matrix:	Soil	Date Extracted:	08.18.94
		Date Analyzed:	08.19.94

Parameter	Analytical Result	Detection Limit	Units
Benzene	ND	0.2	mg/kg
Toluene	ND	0.2	mg/kg
Ethylbenzene	ND	0.2	mg/kg
m,p-Xylene	ND	0.2	mg/kg
o-Xylene	ND	0.2	mg/kg

ND - Compound not detected at stated Detection Limit.

## Reference:

Method 8021, Volatile Organic Compounds, Test Methods for Evaluating  
Solid Waste, Physical/Chemical Methods, United States Environmental  
Protection Agency, SW-846, Volume IB, December 1987.

Analysis Method: Gas Chromatograph / Purge and Trap / PID

31  
AnalystWb  
ReviewedWb

**QUALITY ASSURANCE / QUALITY CONTROL**

F

B

T

E

R

M

Re

Me

So

Pro

Me

So

Pro

Ans

Ans

AB QA/QC  
GASOLINE RANGE ORGANICS - GRO  
METHOD BLANK

Date Analyzed: 08/18/94

Laboratory ID: MB 230

Sample Matrix: Water

Parameter	Result	PQL	Units
Gasoline Range Organics	ND	0.01	mg/L
Gasoline Range Organics as	ND	0.01	mg/L
Total Purgeable Hydrocarbon	ND	0.01	mg/L


## QUALITY CONTROL:

Surrogate Recovery	%
Bromofluorobenzene	134

ND - Not detected at stated Practical Quantitation Limit (PQL).

## Reference:

GRO - USEPA Method for Determination of Gasoline Range Organics, Revision 5, February 1992.

WTPH-G Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology,  
Revision 3, October 1991.Method 5030, Purge and Trap, & Method 8000, Gas Chromatography, United States  
Environmental Protection Agency, SW-846, Volume IB, December 1987.  
Analyst  
Reviewed

AB QA/QC  
DIESEL RANGE ORGANICS - DRO  
METHOD BLANKDate Analyzed: 08/19/94  
Lab ID: MBS00231  
Matrix: Soil

Parameter	Result	PQL	Units
-----------	--------	-----	-------

Diesel Range Organics	ND	5	mg/kg
-----------------------	----	---	-------

ND - Not Detected at Practical Quantitation Level (PQL).

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 2, February 1992.

WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State  
Department of Ecology. Revision 3, October 1991.Analyst Sharon BetkeReviewed UB

LAB QA/QC  
TRACE METALS - TCLP  
METHOD BLANK

Date Analyzed: 08/25/94  
Laboratory ID: TMB 94-30  
Sample Matrix: Extract

Parameter	Sample Result	PQL	Regulatory Level	Units
Arsenic	ND	0.2	5.0	mg/L
Barium	ND	5	100.0	mg/L
Cadmium	ND	0.05	1.0	mg/L
Chromium	ND	0.05	5.0	mg/L
Lead	ND	0.2	5.0	mg/L
Mercury	ND	0.02	0.2	mg/L
Selenium	ND	0.2	1.0	mg/L
Silver	ND	0.05	1.0	mg/L

ND-Parameter not detected at stated detection level.

## References:

Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

## LAB QA/QC

EPA METHOD 8020 / 602

AROMATIC VOLATILE COMPOUNDS

EXTRACTION MATRIX SPIKE / EXTRACTION MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 08/19/94  
Laboratory ID: EMS/EMSD 7366  
Sample Matrix: Soil  
Date Extracted: 8/18/94

## ORIGINAL SAMPLE PARAMETERS

Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	EMS Conc. (mg/kg)	EMS Recovery (%)	QC Limits (% Rec.)
Benzene	8	0.0	7.3	91	50-110
Toluene	8	0.0	7.5	94	58-110
Ethylbenzene	8	0.0	7.1	89	59-116
m,p-Xylene	16	0.0	14	88	61-112
o-Xylene	8	0.0	7.4	93	60-117

## DUPLICATE SAMPLE PARAMETERS

Parameter	Spike Added (mg/kg)	EMSD Conc. (mg/kg)	EMSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
Benzene	8	7.1	89	3	25	50-110
Toluene	8	7.2	90	4	25	58-110
Ethylbenzene	8	6.6	83	7	25	59-116
m,p-Xylene	16	13	81	7	25	61-112
o-Xylene	8	6.7	84	10	25	60-117

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.

  
\_\_\_\_\_  
Analyst  
\_\_\_\_\_  
Reviewed

AB QA/QC  
TRACE METALS - TCLP  
METHOD BLANK

Date Analyzed: 08/25/94  
Laboratory ID: TMB 94-30  
Sample Matrix: Extract

Parameter	Sample Result	PQL	Regulatory Level	Units
Arsenic	ND	0.2	5.0	mg/L
Barium	ND	5	100.0	mg/L
Cadmium	ND	0.05	1.0	mg/L
Chromium	ND	0.05	5.0	mg/L
Lead	ND	0.2	5.0	mg/L
Mercury	ND	0.02	0.2	mg/L
Selenium	ND	0.2	1.0	mg/L
Iver	ND	0.05	1.0	mg/L

ND-Parameter not detected at stated detection level.

References:

Toxicity Characteristic Leaching Procedure , Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

AB QA/QC  
EPA METHOD 8020 / 602  
AROMATIC VOLATILE COMPOUNDS  
EXTRACTION MATRIX SPIKE / EXTRACTION MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 08/19/94  
Laboratory ID: EMS/EMSD 7366  
Sample Matrix: Soil  
Date Extracted: 8/18/94

ORIGINAL SAMPLE PARAMETERS

Parameter	Spike Added (mg/kg)	Sample Conc. (mg/kg)	EMS Conc. (mg/kg)	EMS Recovery (%)	QC Limits (% Rec.)
Benzene	8	0.0	7.3	91	50-110
Toluene	8	0.0	7.5	94	58-110
Ethylbenzene	8	0.0	7.1	89	59-116
m,p-Xylene	16	0.0	14	88	61-112
o-Xylene	8	0.0	7.4	93	60-117

DUPLICATE SAMPLE PARAMETERS

Parameter	Spike Added (mg/kg)	EMSD Conc. (mg/kg)	EMSD Recovery (%)	RPD (%)	QC Limits	
					RPD	Rec.
Benzene	8	7.1	89	3	25	50-110
Toluene	8	7.2	90	4	25	58-110
Ethylbenzene	8	6.6	83	7	25	59-116
m,p-Xylene	16	13	81	7	25	61-112
o-Xylene	8	6.7	84	10	25	60-117

Spike Recovery: 0 out of 10 outside QC limits.  
RPD: 0 out of 5 outside QC limits.

Analyst

Reviewed

LAB QA/QC  
TRACE METALS - TCLP  
DUPLICATE SUMMARY

Date Analyzed: 08/25/94  
Laboratory ID: B947385  
Sample Matrix: Soil

Parameter	Sample Result	Duplicate Sample Result	RPD %	PQL	Units
Arsenic	ND	ND	0	0.2	mg/L
Barium	0.7	0.7	0	5	mg/L
Cadmium	0.08	0.08	0	0.05	mg/L
Chromium	ND	ND	0	0.05	mg/L
Lead	21	22	5	0.2	mg/L
Mercury	ND	ND	0	0.02	mg/L
Selenium	ND	ND	0	0.2	mg/L
ver	ND	ND	0	0.05	mg/L

ND-Parameter not detected at stated detection level.

References:

Toxicity Characteristic Leaching Procedure , Final Rule,  
Federal Register, 40 CFR 261-302. Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

1B QA/QC  
TRACE METALS - TCLP  
MATRIX SPIKE

Date Analyzed: 08/25/94  
Laboratory ID: B947386  
Sample Matrix: Soil

Parameter	Spike Added (mg/L)	Sample Conc. (mg/L)	MS Conc. (mg/L)	MS Recovery (%)	QC Limits (% Rec.)
Arsenic	2.5	ND	2.6	105	75 - 125
Barium	5.0	1.1	6.0	97	75 - 125
Cadmium	0.50	0.66	1.12	92	75 - 125
Chromium	2.0	ND	2.0	98	75 - 125
Lead	2.0	4.3	6.1	91	75 - 125
Mercury	0.20	ND	0.21	103	75 - 125
Selenium	2.5	ND	2.9	114	75 - 125
Ver	0.05	ND	0.06	121	75 - 125

ND-Parameter not detected at stated detection level.

References:


Toxicity Characteristic Leaching Procedure, Final Rule,  
Federal Register, 40 CFR 261-302, Part V, EPA Vol 55, No. 126, June 29, 1990

Method 3010: Acid Digestion of Aqueous Samples and Extracts  
for Total Metals, SW-846, Sept. 1986.

Method 6010: Inductively Coupled Plasma-Atomic Emission  
Spectroscopy, SW-846, Sept. 1990.

Method 7470: Mercury in Liquid Waste (Manual Cold-Vapor  
Technique), SW-846, Sept. 1986.

  
Analyst

  
Reviewed

**LAB QA/QC**  
**GASOLINE RANGE ORGANICS - GRO**  
**EXTRACTION MATRIX SPIKE / EXTRACTION MATRIX SPIKE DUPLICATE**

Date Analyzed: 08/19/94  
Laboratory ID: EMS/EMSD 7366  
Sample Matrix: Soil  
Date Extracted: 8/15/94

Parameter	EMS Found Results (mg/kg)	EMS Expected Results (mg/kg)	EMS Percent Recovery
Gasoline Range Organics	63	50	126%


Parameter	EMSD Found Results (mg/kg)	EMSD Expected Results (mg/kg)	EMSD Percent Recovery	RPD %
Gasoline Range Organics	65	50	130%	3

**References:**

GRO - USEPA Method for Determination of Gasoline Range Organics. Revision 5, February 1992.

WTPH-G Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology,  
Revision 3, October 1991.

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Reviewed

R QA/QC  
DIESEL RANGE ORGANICS - DRO  
BLANK SPIKE

Date Analyzed: 08/19/94  
ID: BSS00231  
Matrix: Soil

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
Diesel Range Organics	25	0	17	68	50 - 150

Recovery: 0 out of 1 outside QC limits.

Reference: DRO - USEPA Method for Determination of Diesel Range Organics. Revision 2, February 1992.

WTPH-D Total Petroleum Hydrocarbons Analytical Methods for Soil, Washington State Department of Ecology, Revision 3, October 1991.

Analyst Shawn Pettig

Reviewed WJ



*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX H**

**EPA INFORMATION ON RICO-ARGENTINE MINE AND  
NPL SITES IN COLORADO**

Rico Argentine

RECORD OF COMMUNICATION

December 3, 1993  
9 am

Stan Powers  
Bureau of Reclamation  
Durango Colorado  
(303)385-6555

COPY

Pat Smith  
Site Assessment  
Manager

MK had called the Bureau of Reclamation to ask for their data. They have done considerable study on the mercury in lakes issue for McPhee, Totten, and Narraguinnep. I had not even heard of the Totten mercury. Water, fish and sediment samples have been taken in the river and in these three lakes. Totten and Narraguinnep are off-river.

Mercury was found in the fish in all three reservoirs, but not in the fish in the Dolores River above the reservoirs. There was no mercury in fish downstream of McPhee. Lake analysis was of fish filets. He couldn't recall offhand, but he thought the river fish analysis was for whole fish or filets.

After all the samples they've collected, their theory is that the mercury is naturally occurring and that it isn't methylated and taken up by the fish until it reaches the lake (at least at McPhee). At Ridgeway reservoir, where mining and naturally occurring metals loading could take place (downstream of Idarado), they scraped the surface down to bedrock before creating the reservoir and have no problems with elevated concentrations in the fish.

One area of significant metals loading they found in their study was the Rico-Argentine area. He mentioned that tailings were used for street cover there, and after rains there were complaints of dying yards. Metals loading here included mercury. Silver Creek flows down from the Argentine. It is devoid of aquatic life. Above the mine is clean and there may be life up there. Rico gets its water supply from above the mine.

He'll send the raw data to MK for their SI. We both hoped it would replace our need to do further sampling for the McPhee SI.

-----  
ACTION:

Take the No Further Action flag off the Rico Argentine site.



COPY

ANALYTICAL RESULTS FOR  
RICO-ARGENTINE MINE  
RICO, ARGENTINE  
TDD# R8-8502-09

EPA PROJECT OFFICER: DAVE SCHALLER  
FIT PROJECT OFFICER: MEG BABITS

SUBMITTED TO: KEITH SCHWAB - FIT DPO

DATE SUBMITTED: July 29, 1985

## TABLE OF CONTENTS

I. INTRODUCTION.....	1
II. QUALITY ASSURANCE REVIEW.....	2
III. ANALYTICAL RESULTS.....	3
IV. INTERPRETATION OF RESULTS.....	4
V. CONCLUSION.....	4

## LIST OF FIGURES

- FIGURE 1 SITE LOCATION MAP  
FIGURE 2 SAMPLE LOCATION MAP

## LIST OF TABLES

- TABLE 1 TOTAL INORGANIC PARAMETERS DETECTED IN SURFACE WATER  
TABLE 2 DISSOLVED INORGANIC PARAMETERS DETECTED IN SURFACE WATER  
TABLE 3 TOTAL INORGANIC PARAMETERS DETECTED IN SEDIMENT  
TABLE 4 WATER QUALITY STANDARDS FOR THE DOLORES RIVER  
TABLE 5 WATER QUALITY STANDARDS FOR SILVER CREEK  
TABLE 6 NATIONAL INTERIM PRIMARY AND SECONDARY DRINKING WATER  
STANDARDS AND CRITERIA

ANALYTICAL RESULTS FOR  
RICO-ARGENTINE MINE  
IN RICO, COLORADO

I. INTRODUCTION

This report was prepared to satisfy the requirements of Technical Directive Document (TDD) R8-8502-09 issued to Ecology and Environment, Inc. Field Investigation Team (E&E FIT) by the Region VIII Environmental Protection Agency (EPA). The report describes analytical data resulting from sample collection at the Rico-Argentine Mine on November 14, 1985. The purpose of this sampling effort was to evaluate the extent of contamination that has occurred as a result of past mining activities at the Rico-Argentine Mine. Sampling focused on possible contamination of surface water.

The Rico-Argentine Mine is located north of Rico, Colorado and is an inactive operation owned by the Anaconda Minerals Company. Initially, the chief metal produced in the Rico District was silver. There was a switch to pyrite for sulfuric acid production during the 1954 uranium boom and a sulfuric acid plant was built. Operations consisted of a mill and tailings pond on Silver Creek and an acid plant, cyanide heap leach, and settling ponds on the Dolores River. There were two discharge points associated with the operation. Discharge point 001 was the discharge from the Blaine Tunnel on Silver Creek. There is no longer discharge from 001 because it is redirected underground to the St. Louis Tunnel where it drains into the St. Louis Settling Pond System on the Dolores River. The outfall of the final pond into the Dolores River is discharge point 002.

In April of 1984, Anaconda Minerals Company put into effect a water treatment operation at the St. Louis Tunnel. The operation consists of neutralization using slaked lime.

The city of Rico receives its drinking water supply from Silver Creek above the major mining impacts. The water is treated through infiltration galleries and chlorinated. The site is discussed further in FIT's Site Visit Report and Sampling Plan (TOD R8-8408-17) and the Sampling Activities Report (TOD R8-8411-02). The site location map is shown in Figure 1.

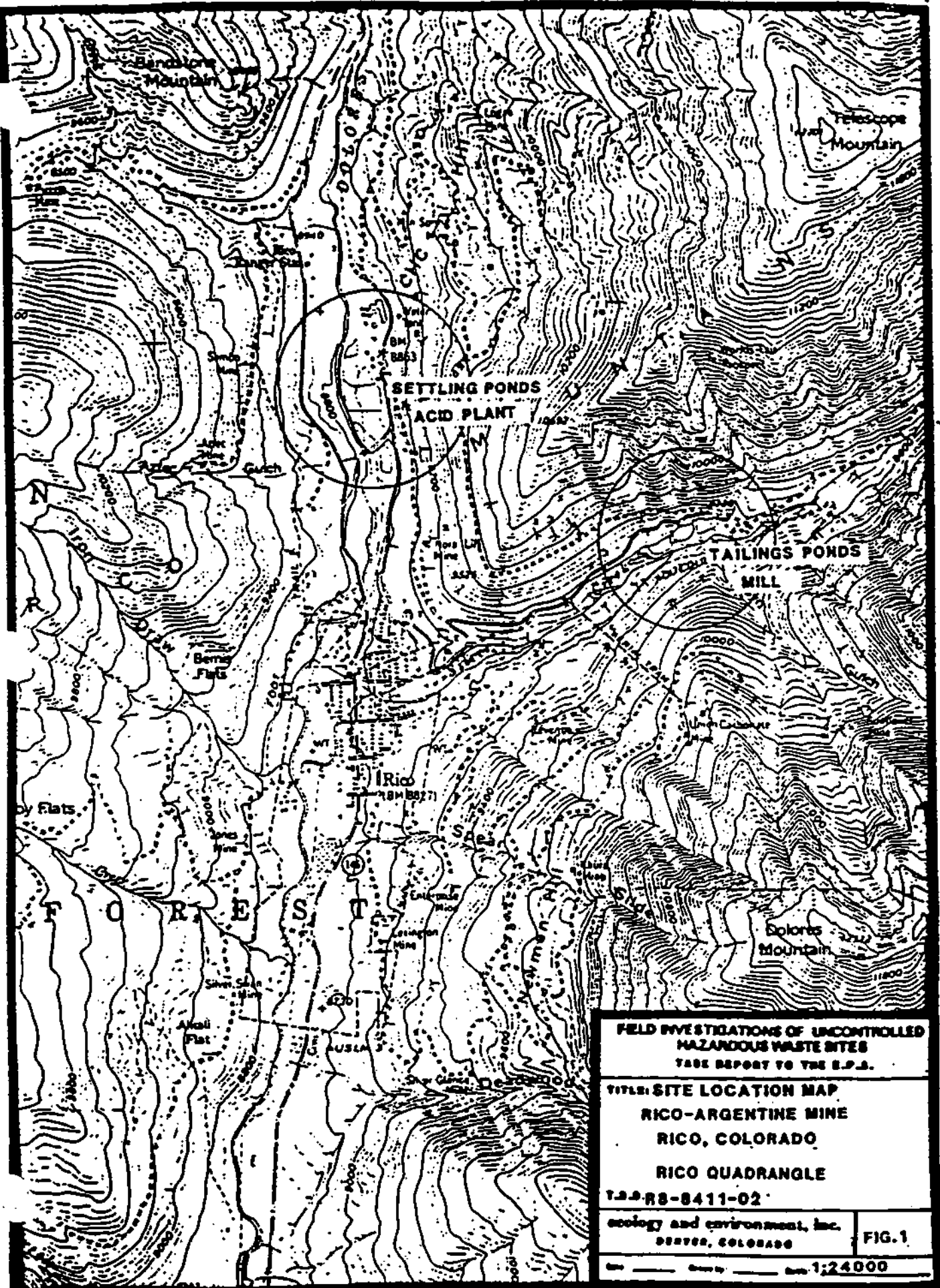
## II. QUALITY ASSURANCE REVIEW

All surface water samples were analyzed by Rocky Mountain Analytical Laboratory (RMA) in Arvada, Colorado. The surface water samples were analyzed for cyanide, sulfate and Task 1 and 2 metals including both total and dissolved analyses. The review of methodology and results was performed by John Graves and Lynn Roberts, both of E&E FIT. The inorganic data produced by RMA were found acceptable for use with one qualification. The holding time for cyanide exceeded the contract requirement. The data will be presented but footnoted as per the previous comment.

All sediment samples were analyzed by the Radian Corporation in Austin, Texas. The sediment samples were analyzed for Task 1 and 2 metals. The review of methodology and results was performed by Lynn Roberts, of E&E FIT. The data were found acceptable for use with several qualifications. The holding time for mercury was exceeded by 2 months. The matrix spike recoveries for antimony, selenium, thallium (recoveries were at 0%) and beryllium, nickel, silver and tin were not within the contract required recoveries. Finally, chromium was detected in the blank at 7.0 mg/kg. The data will be presented but footnoted as per the previous comments. See Appendix A for the complete QC Summary Report.

## III. ANALYTICAL RESULTS

Analytical results for the Rico-Argentine Mine sampling effort have been tabulated below. The analyses of the total inorganic



**FIELD INVESTIGATIONS OF UNCONTROLLED  
HAZARDOUS WASTE SITES  
TASK REPORT TO THE E.P.A.**

**TITLE: SITE LOCATION MAP  
RICO-ARGENTINE MINE  
RICO, COLORADO  
RICO QUADRANGLE**

**T-2-R8-8411-02**

**ecology and environment, inc.**  
**DENVER, COLORADO**

**FIG. 1**

Case \_\_\_\_\_ Class by \_\_\_\_\_ Date **1:24000**

parameters and the dissolved inorganic parameters in surface water are presented in Table 1 and 2, respectively. The analyses of inorganic parameters in sediment are provided in Table 3. Water Quality Standards for the Dolores River and Silver Creek are presented in Tables 4 and 5, respectively. The National Interim Primary and Secondary Drinking Water Standards and Criteria are provided in Table 6. Location of all samples are shown in Figure 2.

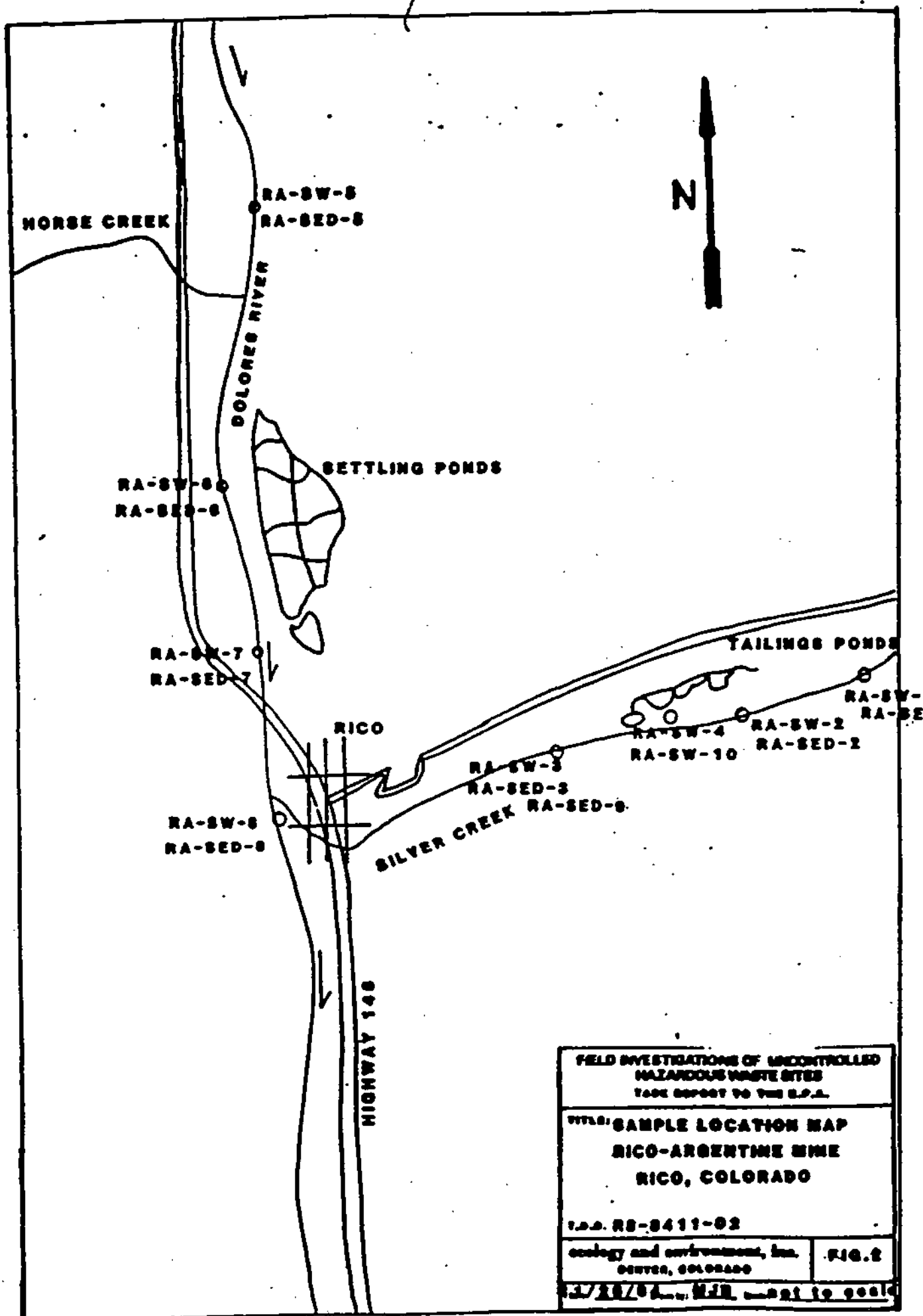
#### IV. INTERPRETATION OF RESULTS

Water samples from streams were compared with the drinking water standards and criteria in Table 6. The standards are legally enforceable, while criteria are recommended levels. Some elements such as calcium, magnesium and potassium do not have criteria. It is important to emphasize that these waters are apparently not used as drinking water sources. The comparison is made as a measurement of water quality degradation. In comparing drinking water standards to samples, dissolved concentrations of surface water are used. the drinking water standards are also reported in dissolved concentrations.

There were no occurrences of any standards being exceeded in Silver Creek. Leachate samples RA-SW-4 and duplicate RA-SW-10 had concentrations of beryllium, iron, manganese and zinc that exceeded the criteria. Surface water sample RA-SW-3 had manganese concentrations that exceeded its criteria. RA-SW-4 and RA-SW-10 had sulfate concentrations that were 700,000 ug/l greater than the background surface water sample.

There were no occurrences of any standards being exceeded in the Dolores River. Surface water sample RA-SW-6, RA-SW-7 and RA-SW-8 all had concentrations of manganese that exceeded the criteria level.

Water samples from streams were also compared with water quality standards for the Dolores River and Silver Creek. These standards are not control regulations, but are data put out by the Colorado



**FIELD INVESTIGATIONS OF UNCONTROLLED  
HAZARDOUS WASTE SITES  
TASK REPORT TO THE U.S.A.**

**TITLE: SAMPLE LOCATION MAP  
RICO-ARGENTINE MINE  
RICO, COLORADO**

**U.S.A. RS-3411-02**

**ecology and environment, Inc.  
DENVER, COLORADO**

**FIG. 2**

**1/28/82 M/R sent to field**

Department of Health (CDH). The CDH reports standards in total concentration. In comparing standards to samples, total concentrations of surface water are used. On Silver Creek, RA-SW-4 and duplicate RA-SW-10 which are leachate samples from tailings exceeded criteria for cadmium, copper, iron, lead, manganese, silver, zinc. There are no sulfate standards for Silver Creek. On the Dolores River, no criteria were exceeded. There are no sulfate standards for the Dolores River.

Sediment samples from Silver Creek and the Dolores River were collected from each surface water sampling location. In Silver Creek, concentrations of arsenic, cadmium, copper, iron, lead, manganese and zinc were detected in the downgradient samples (RA-SED-2, RA-SED-3, RA-SED-9) in much higher quantities than the upgradient sample (RA-SED-1). In the Dolores River, concentrations of arsenic, cadmium, copper, iron, lead, manganese and zinc were detected in the downgradient samples (RA-SED-7 and RA-SED-8) in much higher quantities than the upgradient sample (RA-SED-5).

#### V. CONCLUSION

The surface water data from RMA were found acceptable for use with one qualification. The holding time for cyanide was exceeded by one month. The sediment data from Radian were found acceptable for use with several qualifications. The holding time for mercury was exceeded by two months, matrix spike recoveries for six compounds were less than the acceptable limit and chromium was found in the blank.

When interpreting the surface water data from both Silver Creek and the Dolores River, it seems that the only compound of high concentration in downstream waters is manganese. The leachate from the Silver Creek tailings ponds appears to be diluted in a short distance.

The sediment data shows concentrations of metals that are clearly greater than the upstream samples. It is apparent that the metals are either precipitating from solutions or are being transported elastically. A strong coorelation can be made between metals found in downstream samples and mining operations. An extensive sediment sampling effort might be useful at this site.

The sediment data shows concentrations of metals that are clearly greater than the upstream samples. It is apparent that the metals are either precipitating from solutions or are being transported elastically. A strong coorelation can be made between metals found in downstream samples and mining operations. An extensive sediment sampling effort might be useful at this site.

TABLE 1: TOTAL INORGANIC PARAMETERS DETECTED IN SILVER CREEK SURFACE WATER  
SAMPLES COLLECTED FROM RICO-ARGENTINE MINE IN RICO, COLORADO ON  
NOVEMBER 14, 1985.  
(concentrations in ug/l)

	SW-1	SW-2	SW-3	SW-4
ALUMINUM	ND(35)	58 <sup>a</sup>	85 <sup>a</sup>	1,220
ANTIMONY	54	ND(51)	ND(51)	ND(51)
ARSENIC	ND(10)	ND(10)	ND(10)	3.6 <sup>a</sup>
BARIUM	112 <sup>a</sup>	111 <sup>a</sup>	94 <sup>a</sup>	20 <sup>a</sup>
BERYLLIUM	ND(.6)	ND(.6)	ND(.6)	1.8 <sup>a</sup>
CADMIUM	ND(5)	5.6	ND(5)	7.5
CALCIUM	34,900	36,800	52,800	252,000
CHROMIUM	ND(4)	ND(4)	ND(4)	5.0 <sup>a</sup>
COBALT	ND(6)	ND(6)	ND(6)	17 <sup>a</sup>
COPPER	6.8 <sup>a</sup>	5.9 <sup>a</sup>	6.2 <sup>a</sup>	15 <sup>a</sup>
CYANIDE <sup>b</sup>	ND(.1)	ND(.1)	ND(.1)	ND(.1)
IRON	44 <sup>a</sup>	126	353	22,900
LEAD	ND(2)	ND(5)	ND(5)	130
MAGNESIUM	3,690 <sup>a</sup>	4,160 <sup>a</sup>	6,610	43,900
MANGANESE	5.7 <sup>a</sup>	37	474	12,500
MERCURY	ND(.1)	ND(.1)	ND(.1)	ND(.1)
NICKEL	ND(7)	ND(7)	ND(7)	19 <sup>a</sup>
POTASSIUM	ND(1,200)	ND(1,200)	ND(1,200)	2,580 <sup>a</sup>
SELENIUM	ND(5)	ND(5)	ND(5)	ND(50)
SILVER	ND(5)	ND(5)	ND(5)	ND(5)
SODIUM	1,750 <sup>a</sup>	ND(720)	ND(720)	2,500 <sup>a</sup>
SULFATE	8,000	15,000	64,000	740,000
THALLIUM	ND(10)	ND(10)	ND(10)	ND(10)
TIN	ND(28)	ND(28)	ND(28)	ND(28)
VANADIUM	ND(5)	ND(5)	ND(5)	ND(5)
ZINC	17 <sup>a</sup>	329	65.1	11,800
pH <sup>c</sup>	6.60	6.88	7.30	6.25
ec <sup>c</sup>	240	200	290	1,200

<sup>a</sup> - Detected but less than CLP detection limits

- Holding times were exceeded

<sup>c</sup> - pH reported as standard units, ec reported as umhos/cm

ND (#) - not detected (detection limit)

TABLE 1 (cont.): TOTAL INORGANIC PARAMETERS DETECTED IN DOLORES RIVER  
SURFACE WATER SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
IN RICO, COLORADO ON NOVEMBER 14, 1985.  
(concentrations in ug/l)

	SW-5	SW-6	SW-7	SW-8
ALUMINUM	ND(35)	63 <sup>a</sup>	73 <sup>a</sup>	37 <sup>a</sup>
ANTIMONY	ND(51)	ND(51)	ND(51)	ND(51)
ARSENIC	ND(10)	ND(10)	ND(10)	ND(10)
BARIUM	61 <sup>a</sup>	57 <sup>a</sup>	44 <sup>a</sup>	58 <sup>a</sup>
BERYLLIUM	ND(.6)	ND(.6)	ND(.6)	ND(.6)
CADMIUM	ND(5)	ND(5)	ND(5)	ND(5)
CALCIUM	33,600	39,900	92,000	53,600
CHROMIUM	ND(4)	ND(4)	ND(4)	ND(4)
COBALT	ND(6)	ND(6)	ND(6)	ND(6)
COPPER	ND(5)	8.7 <sup>a</sup>	6.2 <sup>a</sup>	8.0 <sup>a</sup>
CYANIDE <sup>b</sup>	ND(.1)	ND(.1)	ND(.1)	ND(.1)
IRON	138	320	223	199
LEAD	ND(5)	ND(5)	ND(5)	ND(5)
MAGNESIUM	5,340	5,900	7,380	6,720
MANGANESE	17	221	155	141
MERCURY	ND(.1)	ND(.1)	ND(.1)	ND(.1)
NICKEL	ND(7)	ND(7)	ND(7)	ND(7)
POTASSIUM	ND(1,200)	ND(1,200)	ND(1,200)	ND(1,200)
SELENIUM	ND(5)	ND(5)	ND(5)	ND(5)
SILVER	ND(5)	ND(5)	ND(5)	ND(5)
SODIUM	ND(720)	ND(720)	2,370 <sup>a</sup>	ND(720)
SULFATE	21,000	44,000	185,000	72,000
THALLIUM	ND(10)	ND(10)	ND(10)	ND(10)
TIN	ND(28)	ND(38)	ND(28)	ND(28)
VANADIUM	ND(5)	ND(5)	ND(5)	ND(5)
ZINC	67	61	59	74
pH <sup>c</sup>	6.88	6.77	6.86	6.74
ec <sup>c</sup>	200	200	570	400

a - Detected but less than CLP detection limits

b - Holding times were exceeded

c - pH reported as standard units, ec reported as umhos/cm

ND (#) - not detected (detection limit)

TABLE 1 (cont.): TOTAL INORGANIC PARAMETERS DETECTED IN SURFACE WATER  
 SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
 IN RICO, COLORADO ON NOVEMBER 14, 1985.  
 (concentrations in ug/l)

	SW-9	SW-10
ALUMINUM	ND(35)	4,150
ANTIMONY	79	ND(51)
ARSENIC	ND(10)	19
BARIUM	ND(12)	40 <sup>a</sup>
BERYLLIUM	1.0 <sup>a</sup>	3.3 <sup>a</sup>
CADMIUM	5.6	8.2
CALCIUM	342 <sup>a</sup>	244,000
CHROMIUM	ND(4)	11
COBALT	ND(6)	25 <sup>a</sup>
COPPER	12 <sup>a</sup>	83
CYANIDE <sup>b</sup>	ND(.1)	ND(.1)
IRON	12 <sup>a</sup>	66,200
LEAD	4.3 <sup>a</sup>	1,140
MAGNESIUM	ND(390)	43,400
MANGANESE	ND(4)	14,400
MERCURY	ND(.1)	ND(.1)
NICKEL	ND(7)	15 <sup>a</sup>
POTASSIUM	ND(1,200)	2,980 <sup>a</sup>
SELENIUM	ND(5)	ND(50)
SILVER	ND(5)	9.9 <sup>a</sup>
SODIUM	ND(720)	2,580 <sup>a</sup>
SULFATE	ND(5,000)	650,000
THALLIUM	ND(10)	ND(10)
TIN	ND(28)	ND(28)
VANADIUM	ND(5)	6.7 <sup>a</sup>
ZINC	32	13,800
pH <sup>c</sup>	--	6.26
ec <sup>c</sup>	--	1,200

a - Detected but less than CLP detection limits

b - Holding times were exceeded

c - pH reported as standard units, ec reported as umhos/cm

ND (#) - not detected (detection limit)

TABLE 2: DISSOLVED INORGANIC PARAMETERS DETECTED IN SILVER CREEK  
SURFACE WATER SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
IN RICO, COLORADO ON NOVEMBER 14, 1985.  
(concentrations in ug/l)

	SW-1	SW-2	SW-3	SW-4
ALUMINUM	ND(35)	ND(35)	ND(35)	785
ANTIMONY	ND(51)	ND(51)	ND(51)	ND(51)
ARSENIC	ND(3)	ND(3)	ND(3)	ND(10)
BARIUM	157 <sup>a</sup>	160 <sup>a</sup>	133 <sup>a</sup>	54 <sup>a</sup>
BERYLLIUM	ND(.6)	ND(.6)	ND(.6)	1.5 <sup>a</sup>
CADMIUM	ND(5)	ND(5)	ND(5)	ND(5)
CALCIUM	34,200	35,900	52,700	231,000
CHROMIUM	ND(4)	ND(4)	ND(4)	ND(4)
COBALT	ND(6)	ND(6)	ND(6)	14 <sup>a</sup>
COPPER	ND(5)	ND(5)	ND(5)	ND(5)
IRON	12 <sup>a</sup>	49 <sup>a</sup>	ND(10)	16,500
LEAD	ND(2)	ND(2)	ND(2)	ND(5)
MAGNESIUM	3,400 <sup>a</sup>	3,930 <sup>a</sup>	6,470	40,100
MANGANESE	ND(4)	38	454	11,200
MERCURY	ND(.1)	ND(.1)	ND(.1)	ND(.1)
NICKEL	ND(7)	ND(7)	ND(7)	12 <sup>a</sup>
POTASSIUM	ND(1,200)	ND(1,200)	ND(1,200)	2,440 <sup>a</sup>
SELENIUM	ND(2)	ND(2)	ND(2)	ND(20)
SILVER	ND(5)	ND(5)	ND(5)	ND(5)
SODIUM	ND(720)	ND(720)	ND(720)	ND(720)
THALLIUM	ND(6)	ND(6)	ND(6)	ND(6)
TIN	ND(28)	ND(28)	ND(28)	35 <sup>a</sup>
VANADIUM	ND(5)	ND(5)	ND(5)	ND(5)
ZINC	14 <sup>a</sup>	283	561	10,800

a - Detected but less than CLP detection limits  
ND (#) - not detected (detection limit)

TABLE 2 (cont.): DISSOLVED INORGANIC PARAMETERS DETECTED IN DOLORES RIVER  
SURFACE WATER SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
IN RICO, COLORADO ON NOVEMBER 14, 1985.  
(concentrations in ug/l)

	SW-5	SW-6	SW-7	SW-8
ALUMINUM	ND(35)	ND(35)	ND(35)	ND(35)
ANTIMONY	ND(51)	ND(51)	ND(51)	ND(51)
ARSENIC	ND(10)	ND(10)	ND(10)	ND(10)
BARIUM	96 <sup>a</sup>	92 <sup>a</sup>	84 <sup>a</sup>	108 <sup>a</sup>
BERYLLIUM	ND(.6)	ND(.6)	ND(.6)	ND(.6)
CADMIUM	ND(5)	ND(5)	ND(5)	ND(5)
CALCIUM	29,300	35,000	82,100	55,600
CHROMIUM	ND(4)	ND(4)	ND(4)	ND(4)
COBALT	ND(6)	ND(6)	ND(6)	ND(6)
COPPER	ND(5)	ND(5)	ND(5)	ND(5)
IRON	45 <sup>a</sup>	89 <sup>a</sup>	24 <sup>a</sup>	40 <sup>a</sup>
LEAD	ND(2)	ND(2)	ND(5)	ND(2)
MAGNESIUM	4,590 <sup>a</sup>	5,060	6,540	6,850
MANGANESE	10 <sup>a</sup>	188	134	140
MERCURY	ND(.1)	ND(.1)	ND(.1)	ND(.1)
NICKEL	ND(7)	ND(7)	ND(7)	ND(7)
POTASSIUM	ND(1,200)	ND(1,200)	1,230 <sup>a</sup>	ND(1,200)
SELENIUM	ND(2)	ND(2)	ND(2)	ND(2)
SILVER	ND(5)	ND(5)	ND(5)	ND(5)
SODIUM	ND(720)	ND(720)	ND(720)	ND(720)
THALLIUM	ND(6)	ND(6)	ND(6)	ND(6)
TIN	ND(28)	ND(28)	31 <sup>a</sup>	ND(28)
VANADIUM	ND(5)	ND(5)	ND(5)	ND(5)
ZINC	29	30	47	90

a - Detected but less than CLP detection limits

b - Holding times were exceeded

c - pH reported as standard units, ec reported as umhos/cm

ND (#) - not detected (detection limit)

TABLE 2 (cont.): DISSOLVED INORGANIC PARAMETERS DETECTED IN SURFACE WATER  
 SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
 IN RICO, COLORADO ON NOVEMBER 14, 1985.  
 (concentrations in ug/l)

	SW-9	SW-10
ALUMINUM	ND(35)	830
ANTIMONY	ND(51)	ND(51)
ARSENIC	ND(10)	ND(10)
BARIUM	26 <sup>a</sup>	60 <sup>a</sup>
BERYLLIUM	ND(.6)	1.8 <sup>a</sup>
CADMIUM	ND(5)	9.6
CALCIUM	ND(330)	240,000
CHROMIUM	ND(4)	ND(4)
COBALT	ND(6)	17 <sup>a</sup>
COPPER	ND(5) <sup>a</sup>	ND(5)
IRON	ND(10)	17,200
LEAD	ND(2)	ND(5)
MAGNESIUM	ND(390)	41,500
MANGANESE	ND(4)	11,600
MERCURY	ND(.1)	ND(.1)
NICKEL	ND(7)	11 <sup>a</sup>
POTASSIUM	ND(1,200)	2,540 <sup>a</sup>
SELENIUM	ND(2)	ND(20)
SILVER	ND(5)	ND(5)
SODIUM	ND(720)	1,370 <sup>a</sup>
THALLIUM	ND(6)	ND(6)
TIN	ND(28)	ND(28)
VANADIUM	ND(5)	ND(5)
ZINC	11	11,100

a - Detected but less than CLP detection limits  
 ND (#) - not detected (detection limit)

TABLE 3: INORGANIC PARAMETERS DETECTED IN SILVER CREEK  
SEDIMENT SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
IN RICO, COLORADO ON NOVEMBER 14, 1985.  
(concentrations in mg/kg)

	RA-SED-1	RA-SED-2	RA-SED-3	RA-SED-9
ALUMINUM	4,560	10,600	6,990	7,600
ANTIMONY	20 <sup>ab</sup>	ND(17) <sup>b</sup>	ND(18) <sup>b</sup>	45 <sup>b</sup>
ARSENIC	9.0	21	31	26
BARIUM	102	117	149	157
BERYLLIUM (b)	ND(1.1)	ND(1.1)	ND(1.2)	ND(1.3)
CADMIUM	1.3 <sup>a</sup>	3.1	6.7	9.9
CALCIUM	3,810	11,600	7,180	6,380
CHROMIUM (d)	12	14	7.7	17
COBALT	7.7 <sup>a</sup>	6.6 <sup>a</sup>	ND(8.9)	11 <sup>a</sup>
COPPER	9.4 <sup>a</sup>	75	256	224
IRON	8,120	22,300	25,100	23,000
LEAD	19	545	1,350	1,300
MAGNESIUM	2,910	9,710	4,100	4,100
MANGANESE	504	1,650	3,160	2,550
MERCURY (c)	13 <sup>a</sup>	ND(.2)	.11 <sup>a</sup>	.12 <sup>a</sup>
NICKEL (a,b)	7.2	13	4.2	11
POTASSIUM (a)	1,160	821	1,130	1,620
SELENIUM (b)	ND(1.0)	ND(4.9)	ND(5.4)	ND(1.3)
SILVER (b)	ND(2.3)	ND(2.2)	5.8	8.4
SODIUM (a)	1,010	1,040	1,260	1,330
THALLIUM (b)	ND(1.1)	ND(1.1)	ND(1.2)	ND(1.3)
TIN (b)	ND(8.6)	ND(8.3)	ND(8.9)	ND(9.4)
VANADIUM	19	ND(22)	ND(24)	25
ZINC	62	846	2280	1830
PERCENT SOLIDS (%)	87	90	84	80

a - Detected but less than CLP detection limits

b - Spike recovery was less than acceptable limit.

c - Holding time was exceeded

d - Detected concentrations in the blank

ND (#) - not detected (detection limit)

TABLE 3 (cont.): INORGANIC PARAMETERS DETECTED IN DOLORES RIVER  
SEDIMENT SAMPLES COLLECTED FROM RICO-ARGENTINE MINE  
IN RICO, COLORADO ON NOVEMBER 14, 1985.  
(concentrations in mg/kg)

	RA-SED-5	RA-SED-6	RA-SED-7	RA-SED-8
ALUMINUM	5,040	5,600	9,060	7,430
ANTIMONY	ND(16) <sup>b</sup>	25 <sup>a,b</sup>	23 <sup>a,b</sup>	40 <sup>b</sup>
ARSENIC	8.8	9.8	12	12
BARIUM	8.9 <sup>a</sup>	111	115	100
BERYLLIUM (b)	ND(1.1)	ND(1.1)	ND(1.1)	3.0
CADMIUM	ND(2.2)	ND(2.3)	2.5	11
CALCIUM	11,100	15,900	7,900	6,050
CHROMIUM (d)	3.2 <sup>a</sup>	5.0	16	20
COBALT	ND(8.3)	ND(8.5)	13 <sup>a</sup>	13 <sup>a</sup>
COPPER	3.2 <sup>a</sup>	12	39	128
IRON	10,600	11,900	22,000	18,700
LEAD	12	14	179	222
MAGNESIUM	3,180	4,200	6,690	4,620
MANGANESE	190	350	1,380	1,380
MERCURY (c)	.10 <sup>a</sup>	ND(.2)	ND(.2)	ND(.2)
NICKEL (a,b)	2.3	5.7	16	14
POTASSIUM (a)	843	981	1,370	1,510
SELENIUM (b)	ND(.99)	ND(1.0)	ND(4.8)	ND(1.1)
SILVER (b)	ND(2.2)	ND(2.3)	ND(2.2)	ND(2.5)
SODIUM	909 <sup>a</sup>	962 <sup>a</sup>	1,230	1,200
THALLIUM (b)	ND(1.1)	ND(1.1)	ND(1.1)	ND(1.3)
TIN (b)	ND(8.3)	ND(8.5)	ND(8.2)	ND(9.4)
VANADIUM	ND(22)	7.1	24	32
ZINC	46	75	568	716
PERCENT SOLIDS (%)	90	88	91	80

a - Detected but less than CLP detection limits  
b - Spike recovery was less than acceptable limit.  
c - Holding time was exceeded  
d - Detected concentrations in the blank  
ND (#) - not detected (detection limit)

**TABLE 4: WATER QUALITY STANDARDS FOR THE DOLORES RIVER  
IN RICO, COLORADO**  
(concentration are in ug/l unless otherwise noted)  
(standards for metals are total unless otherwise noted)

ARSENIC	50
CADMIUM	.4
CHROMIUM	100
COPPER	14
CYANIDE	5 <sup>1</sup>
IRON	1,000
LEAD	4
MANGANESE	1,000
MERCURY	.05
NICKEL	50
SELENIUM	20
SILVER	.1
pH	6.5-9.0 <sup>2</sup>

1. Represents free concentrations
2. pH reported as standard units

**TABLE 5: WATER QUALITY STANDARDS FOR THE SILVER CREEK  
IN RICO, COLORADO**

(concentrations are in ug/l unless otherwise noted)  
(standards for metals are total unless otherwise noted)

ARSENIC	50
CADMIUM	6
CHROMIUM	100
COPPER	20
CYANIDE	5 <sup>1</sup>
IRON	1,000
LEAD	16
MANGANESE	1,000
MERCURY	.05
NICKEL	50
SELENIUM	20
SILVER	.1
ZINC	1,400
pH	6.5-9.0 <sup>2</sup>

1. Represents free concentrations
2. pH reported as standard units

**TABLE 6: NATIONAL INTERIM PRIMARY AND SECONDARY  
DRINKING WATER STANDARDS AND CRITERIA**

**I. From: National Interim Primary Drinking Water Regulations, EPA -  
570/9-76-003 (USEPA, 1976a).**

Arsenic	50 ug/L
Barium	1000 ug/L
Cadmium	10 ug/L
Chromium	50 ug/L
Lead	50 ug/L
Mercury	2.0 ug/L
Selenium	50 ug/L
Silver	50 ug/L

**II. From: U.S. EPA Water Quality Criteria, Federal Register 45  
(231) (U.S. EPA, 1980).**

Antimony	146 ug/L
Beryllium	0.037 ug/L
Copper	1000 ug/L
Nickel	13.4 ug/L
Thallium	13 ug/L
Zinc	5000 ug/L

**III. From: U.S. EPA Quality Criteria for Water (1976b)**

Iron	300 ug/L
Manganese	50 ug/L

**IV. From: Drinking Water and Health, Safe Drinking Water Committee  
(1980)**

Aluminum	5000 ug/L
----------	-----------

## APPENDIX A

FORM A

QC SUMMARY REPORT  
REGION VIII CONTRACT LAB DATA

Project # 8502-09  
R8-54H-02  
Data Reviewed John M. Roberts / John Haines  
Date of Review 2/12/85

Contractor Laboratory Rocky Mtn. Analytical Lab.  
Case No. 3549 Matrix Water  
Site Rico - Argentine Mine  
Sample No. MH 0706 0711  
0707 0712  
0708 0713  
0709 0715 0714  
0710 0715

- ( ☒ ) Data are acceptable for use  
( ☐ ) Data are acceptable for use with qualification noted above  
( ☐ ) Data are preliminary - pending verification by contractor laboratory  
( ☐ ) Data are unacceptable

Following are our findings:

These data are of good quality except  
possibly the cyanide results. The cyanide  
holding time was exceeded by about 1  
month. Therefore, the cyanide results  
must be considered as estimated concentrations.

Form A

Inorganic Data Completeness Checklist

- ☒ Inorganic analysis data sheets
- ☒ Instrument Detection limits
- ☒ Duplicate results
- ☒ Spike results
- ☒ ICP interference check sample
- ☒ Blank results
- ☒ Raw data for calibration standards
- ☒ Raw data for blanks
- ☒ Raw data for samples
- ☒ Raw data for duplicates
- ☒ Raw data for spikes
- ☒ Initial calibration and calibration verification results
- ☒ Continuing calibration verification

Form B

All inorganic standards were within specified contract limits.

Yes ☒

No ☐

Comments: Thallium continuing calibration was slightly low on 1-24-85.

All inorganic detection limits met the contract requirements.

Yes ☒

No ☐

Comments:

All matrix spike requirements were met.

Yes ☐

No ☒

Comments: Selenium recovery was 69%

The interference check sample was run twice per eight hour shift. No massive interferences were present.

Yes ☒

No ☐

Comments:

Form C

A blank ☒ was run with every twenty samples or less per case.

Yes ☒

No ☐

How many elements were detected above the required detection limit? 0

How many elements were detected at greater than one half the amount detected in any sample? 0

Comments:

A duplicate sample was run with every twenty or fewer samples of a similar matrix, or one per case, whichever is more frequent.

Yes ☒

No ☐

The RPD's ☒ were tabulated.

Yes ☒

No ☐

Comments:

All holding ☒ times were met.

Yes ☒

No ☒

Comments: Cyanide holding times were exceeded.  
The cyanide results must be considered as estimates.

## REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

Case No. 3549 Project No. \_\_\_\_\_  
 Site Bakers Park Raso Argentine  
 Contractor Laboratory Radian  
 Data Reviewer JM Roberts Date of Review 5/15/85  
 Sample Matrix soil

Sample No. <sup>sed 3</sup> MH0529 <sup>sed 7</sup> MH0703  
<sup>sed 5</sup> MH0530 <sup>sed 8</sup> MH0704  
<sup>sed 4</sup> MH0531 <sup>sed 9</sup> MH0705  
<sup>sed 1</sup> MH0577  
<sup>sed 2</sup> MH0600

- ( ) Data are acceptable for use .  
 ( ☒ ) Data are acceptable for use with qualification noted above As above  
 ( ) Data are preliminary - pending action or verification  
 ( ) Data are unacceptable

Action required by DPO?

No ☒ Yes \_\_\_\_\_ Following items require action \_\_\_\_\_

Action required by Project Officer (PO)?

No ☒ Yes \_\_\_\_\_

Several elements are flagged with an "R" because of poor spike recovery. It should be noted that antimony, selenium, and thallium had good spike recovery. Arsenic was flagged with an "R" by lab personnel. However according to the criteria listed on page E-6 of SOB 789, arsenic should not be flagged.

Chromium was detected in the blank at 7 mS/Ky. Because of this, chromium results were flagged with a "B".

Form B

All inorganic standards were within specified contract limits. ....

Yes       

No ✓

Comments: 9 free standards were analyzed. One standard had low %R for several elements. The limit is  $\pm 20\%$ .

Arsenic	29%
Calcium	76%
Chromium	79%
Nickel	79%

All inorganic detection limits met the contract requirements.

Yes ✓

No       

Comments:

All matrix spike requirements were met.

Yes       

No ✓

Comments:

zero spike recovery for Antimony, Selenium, and Ithallium

Beryllium	74%
Nickel	150%
Silver	70%
Tin	330%

these elements are flagged with an "R".

The interference check sample was run twice per eight hour shift. No massive interferences were present.

Yes ✓

No       

Comments:

the initial %R for vanadium was 128%. This is outside of the  $\pm 20\%$  limit. However, the final percent recovery was within the control limit (109%).

Form C

A blank was run with every twenty samples or less per case.

Yes ☒

No ☐

How many elements were detected above the required detection limit? 1

Chromium was detected at 7.0 mg/kg, the detection limit was 5 mg/kg.

How many elements were detected at greater than one half the amount detected in any sample?: 1

Comments:

Chromium

A duplicate sample was run with every twenty or fewer samples of a similar matrix, or one per case, whichever is more frequent.

Yes ☒

No ☐

The RPD's were tabulated.

Yes ☒

No ☐

Comments: 5 elem RPD = 32%

All holding times were met.

Yes ☐

No ☒

Comments:

9 hr mercury holding time was exceeded by 2 months.

## Inorganic Data Completeness Checklist

- ☒ Inorganic analysis data sheets
- ☒ Instrument Detection Limits
- ☒ Duplicate results
- ☒ Spike results
- ☒ ICP interference check sample
- ☒ Blank results
- ☒ Raw data for calibration standards
- ☒ Raw data for blanks
- ☒ Raw data for samples
- ☒ Raw data for duplicates
- ☒ Raw data for spikes
- ☒ Initial calibration and calibration verification results
- ☒ Continuing calibration verification

contract requirements.

Yes ☒

No ☐

Comments: .....

All samples were extracted and analyzed within contract holding times..

Yes ☐

No ☒

Comments:

the mercury holding time was exceeded  
by 2 months.

# CALIFORNIA GULCH COLORADO

EPA ID# COD980717938



EPA REGION 8

Lake County  
100 miles west of Denver

## Site Description

The 130 year old California Gulch site is a mining area covering 16 1/2 square miles of a watershed area that drains along California Gulch to the Arkansas River. Starting in 1859, the area was mined extensively for gold, lead, silver, copper, zinc, and manganese. California Gulch collects runoff that drains numerous abandoned mines and wastes from mining, milling, and smelting. Miners built the Yak Tunnel to drain water from the mine works and to make mineral exploration and development easier. This tunnel drains hundreds of miles of mine workings in its 4-mile underground course and discharges approximately 210 tons of various heavy metals each year into California Gulch. Seventy-five known mills dumped tailings into 5-6 miles of drainages and 6 impounded tailings dumps surround the City of Leadville. Seventeen smelters operated at various times around the City processing silver, lead, and zinc. Heavy metal residues are present in much of the City. Contaminated runoff flows through local town storm drains and city streets. The Arkansas River, which receives water from the California Gulch, has been classified as a recreational resource, and is used heavily for irrigation, livestock watering, public water supplies, and fisheries. Approximately 4,000 people live in nearby Leadville and Lake County.

**Site Responsibility:** This site is being addressed through Federal and potentially responsible parties' actions.

### NPL LISTING HISTORY

Proposed Date: 12/30/82

Final Date: 09/08/83

## Threats and Contaminants



The primary contaminants of concern affecting surface water, sediments, and groundwater are the heavy metals cadmium, copper, lead, arsenic, and zinc. The water in several shallow groundwater wells in California Gulch and in some private wells has been shown to exceed the EPA's drinking water standards for cadmium and zinc. Arsenic, cadmium, and lead are present in waste piles and soils. Adverse effects on the fish population have been observed in the Arkansas River. Contaminants have degraded vegetation in pastures downstream, and plant tissues in some cases contained levels of metals toxic to livestock and wildlife. Water in the main stem of California Gulch is unsafe to drink. Other potential threats to the health of the resident population include direct contact with contaminants in the soil.

## Cleanup Approach

---

This site is being addressed in six stages: immediate actions and long-term remedial phases focusing on cleanup of the Yak Tunnel, mine waste rock and tailings, smelters and slag, residential areas, and groundwater and surface water.

## Response Action Status

---



**Immediate Actions:** In 1986, EPA emergency response workers extended public water supply system lines to residences using private wells. In 1990, a potentially responsible party improved the area storm water drainage system in east Leadville to prevent contaminated surface water from coming into contact with residential areas.



**Yak Tunnel Operable Unit:** In 1991, the EPA modified its 1988 remedy to treat the flow of acid water from the Yak Tunnel and to prevent the uncontrolled release of tunnel drainage to the environment. It features: (1) a surge pond to capture tunnel drainage and dissipate the effect of surges from the tunnel on the California Gulch and the Arkansas River; (2) a permanent system to treat the tunnel water before discharging it; (3) installing a flow control bulkhead in the tunnel to stop the uncontrolled discharge of mine drainage; (4) sealing shafts, drill holes, and fractured rock, and diverting surface water to reduce the amount of water entering the tunnel; (5) establishing a surface water and groundwater monitoring system; and (6) preparing a contingency plan. Under EPA direction, the parties potentially responsible for site contamination are designing the remedies and conducting the cleanup. The parties finished building the surge pond and filter unit in 1989 and completed the permanent treatment plant in 1992. Remaining Yak Tunnel activities are scheduled for completion by the end of 1994.



**Groundwater and Surface Water:** The EPA began an investigation in 1987 of materials contributing to contamination of the site. Fullscale studies of surface water and groundwater began in 1991 including surface water sampling, stream-bed sampling, and toxicity testing of the California Gulch, adjacent drainages, and the Arkansas River. Installation of 56 additional monitoring wells and piezometers has been done as part of a larger groundwater study.



**Mine Waste Rock and Tailings:** The potentially responsible parties began an investigation of the primary waste sources in 1991. The investigation is exploring the extent of lead and zinc contamination contained in the mine waste rock and fluvial and impounded tailings. Runoff from these sources drains into surface and groundwater. The investigations and a screening feasibility study were completed in 1993, at which time analysis of alternatives for cleanup will proceed.



**Smelters and Slag:** In 1991, the potentially responsible parties began investigations to determine the possibility and nature and extent of heavy metal releases from smelters and slag. Once the investigation is completed, expected in 1993, alternative cleanup options for final remedy selection will be identified.



**Residential Areas:** In 1991, EPA released a Preliminary Human Health Risk Assessment for the Site. The EPA and the potentially responsible parties are undertaking intensive studies of the concentration of lead, cadmium and arsenic in residential soils and household dust. These and other studies will be used to define the nature and extent of contamination and resulting risk in this area of the site, as well as the best alternatives for cleanup.

## Environmental Progress



Extending the public water supply has provided safe drinking water for affected area residents. The surge pond retaining [this unit has been taken out of service since the treatment plant replaced its function] sediment and suspended solids in the surface waterflow in California Gulch has been operational since 1989; operation of the Yak Tunnel treatment facility in 1992 has improved water quality significantly in California Gulch and the Upper Arkansas River. Metal sludges resulting from treatment plant operations are being shipped off-site for recycling at the PRP's East Helena Smelter. This resource recovery initiative eliminates the need for sludge disposal in landfills and prevents additional pollution at the smelter through substitution of metal fluxing agents.

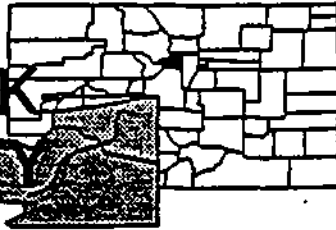
## Site Repository



Lake County Public Library, 1115 Harrison Avenue, Leadville, CO 80461

# **CLEAR CREEK CENTRAL CITY COLORADO**

EPA ID# COD980717557



## **EPA REGION 8 CONGRESSIONAL DIST. 02**

Clear Creek and Gilpin Counties  
30 miles west of Denver

### **Other Names:**

Argo Tunnel  
Big Five Tunnel  
Burleigh Tunnel  
Central City Mining District  
Gregory Incline  
National Tunnel  
Quartz Hill Tunnel  
Chase Gulch  
Gregory Gulch  
Golden Gilpin Mill  
Boodle Mill  
Clay County Tailings  
North Clear Creek Tailings  
Black Eagle Tailings  
Little Bear Creek Tailings  
McClelland Tailings

## **Site Description**

---

The Clear Creek/Central City Superfund site is located approximately 30 miles west of Denver, Colorado. The site boundary has not been narrowly defined because of the nature of the contamination. Extensive historical mining activity at the site took place on a large number of small mining claims. In general, this resulted in the disposal of mine waste rock and tailings piles, which are distributed over a very large area. Additionally, numerous mine tunnels, which were constructed for ore haulage and mine water drainage, are found in the area. Consequently, the investigations at the site have involved identification and prioritization of contamination within the approximately 400 square mile drainage basin for Clear Creek.

Clear Creek has three major tributaries - South, West, and North Clear Creek - as well as numerous smaller tributaries. Designated uses of Clear Creek include agriculture, recreation, and drinking. Recreational uses in Clear Creek include fishing, kayaking, rafting, and tubing. Clear Creek and its tributaries are used in whole or in part as a drinking water source by several municipalities including Georgetown, Idaho Springs, Black Hawk, Golden, Westminster, Thornton, and Arvada.

The Clear Creek drainage basin is located in Clear Creek and Gilpin Counties. The 1988 population estimates show 2,649 residents in Gilpin County and 7,379 residents in Clear Creek County. More densely populated areas include the towns of Silver Plume, Georgetown, Empire, and Idaho Springs in Clear Creek County; and Central City and Black Hawk in Gilpin County. In addition, a large number of the residents of both Counties live in smaller communities, or are dispersed throughout the Counties and live on small acreage.

Land uses in Clear Creek and Gilpin Counties include tourism, commerce, recreation, and to a limited extent, ranching and agriculture. Areas of both Counties were extensively mined in the past because of the abundance of precious and base metals. Active mines are still present at some locations in the Counties. In October 1991, limited stakes gaming was permitted in the towns of Black Hawk and Central City. This new industry is changing the land use and population density in these areas.

**Site Responsibility:** This site is being addressed through Federal and State actions.

**NPL LISTING HISTORY**  
Proposed Date: 07/23/82  
Final Date: 09/08/83

## Threats and Contaminants



Soils, including tailings and waste rock, contain heavy metals such as arsenic, cadmium, chromium, copper, and lead. Children may be at risk from playing on these contaminated areas. Ground water and surface waters also contain heavy metals. People can become exposed by drinking contaminated ground water from private wells in the shallow and deep aquifers. The aquatic environment has been and continues to be severely affected by the elevated levels of metals in Clear Creek and its tributaries.

## Cleanup Approach

The site is being addressed in four stages: immediate actions and three long-term remedial phases directed at cleanup of both mine surface water discharges and tailings and waste rock piles.

## Response Action Status



**Immediate Actions:** In 1987, the EPA constructed a new retaining wall to support the waste rock and tailings known as the Gregory Incline mine dump.

The EPA decreased the slope of the waste pile and replaced the retaining wall to prevent it from collapsing into North Clear Creek. The EPA surveyed local households to determine whether residents were using contaminated water from their private wells. Of the wells tested, only one showed significant levels of contamination from cadmium. The EPA provided the residents with bottled water as an interim measure until their home could be connected to the Idaho Springs municipal water supply. Additionally, EPA connected four other nearby residences to the city water supply; these wells were at risk from future contamination because they drew water from the same aquifer. The Colorado Department of Health conducted a second survey in 1989, and two new problem wells were identified. These will be addressed by future actions.

In 1991, EPA removed mercury contamination from an abandoned trailer in Idaho Springs. The mercury was likely left over from a mine assay laboratory operated inside the trailer.

As mentioned above, limited stakes gaming was legalized in Central City and Black Hawk in 1991. EPA has successfully negotiated five administrative orders on consent with gaming developers. The orders require the developers to clean-up their property prior to the construction of casinos or casino support facilities. Several other consent orders with developers are anticipated, resulting in site clean-up of areas that would otherwise have to be cleaned up at government expense.



**Mine Discharge Treatment of Surface Water Contaminants:** The EPA and the State plan to construct a wetland passive treatment system to treat the mine tunnel discharge from the Burleigh mine tunnel before it reaches Clear Creek.

Colorado Department of Health already has constructed a pilot-treatment system here to determine the ability of passive treatment to meet water quality standards. Results have been promising. An active treatment system using chemical precipitation will be constructed to treat the Argo mine tunnel discharge. These systems will be designed to reduce the mobility, of dissolved and suspended metals in the mine drainages, decrease the acidity of the mine drainages, and meet water quality standards. The State and the EPA will in the future consider treating other mine tunnel discharges in the area.



**Tailings/Waste Rock Remediation:** Tailings and waste rock piles at the Argo, Gregory Incline, Big Five, Quartz Hill, and National will be graded to stable

configuration and diversion ditches will be added to the upslope side of the piles to provide drainage control. The tailings stabilization was completed at the Argo and the Gregory in 1991 and the majority of the Gregory Incline tails were removed by a casino developer in 1994. Tailings stabilization is being designed for the Big Five, the Quartz Hill, and National areas. Design of capping and/or erosion control measures will soon begin for nearly 20 other tailings and waste rock piles. The EPA, the State, and local officials are evaluating institutional measures as a means to control threats that future development on the tailings and waste rock piles could pose to people or the environment.



**Ground Water:** The Colorado Department of Health will soon begin seeking volunteers for private ground water well testing. This will be the third such solicitation. Owners of wells contaminated with metals resulting from mining activities will be eligible to receive bottled water or will be connected to a public water supply system.

**Site Facts:** The Colorado Department of Health is the lead agency for all activities except enforcement-related activities.

## Environmental Progress

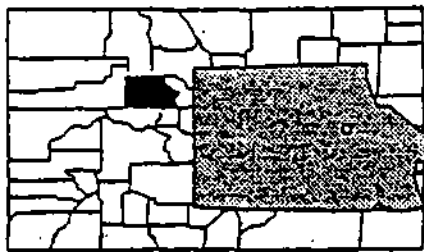


Numerous removal actions have prevented the further spread of contamination from tailings and waste rock piles into North Clear Creek. The EPA provided affected residences with bottled water prior to hooking them up to the municipal water supply. Remedies have been chosen for the treatment of the acidic water and the design of those systems is underway.

Remedial Action has been completed at the McClelland tailings pile near Dumont, Colorado.

# EAGLE MINE COLORADO

EPA ID# COD081961518



## EPA REGION 8

Eagle County  
8 miles west of Vail

Other Names:  
New Jersey Zinc, Inc.  
Gilman

### Site Description

The Eagle Mine site includes the Eagle Mine workings, the town of Gilman, the mine tailings pond areas, Rex Flats, Rock Creek Canyon, and waste rock and roaster piles. This site encompasses an area of approximately 5 to 7 miles along the Eagle River. Over the last 100 years, zinc miners deposited about 10 million tons of mine wastes and mill tailings along the Eagle River. The mining conditions and wastes formed acid, which leached toxic metals into surrounding surface water and groundwater. Five major sources of contamination have been identified at the site: (1) ponds containing tailings over a total of 107 acres; (2) roaster piles, five of which are found at this site; (3) a 25-acre pipeline corridor that extends from Rex Flats to the new tailings pond; (4) twelve major waste rock piles that cover about 93 acres; and (5) seepage from the flooded mine. The closest residence to the Eagle Mine site is approximately 1,000 feet to the northwest. Minturn, the closest population center, has 1,500 people, and its filter ponds and municipal wells lie 2,000 feet to the northwest of the mine tailings and across Cross Creek. Minturn draws its public water supply both from area wells and from Cross Creek. A middle school is located only 400 yards from the largest tailings pile.

**Site Responsibility:** This site is being addressed through Federal, State, and potentially responsible parties' actions.

#### NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

### Threats and Contaminants



Soil, surface water, and groundwater below the tailings piles and the now-flooded mine contain various heavy metals including arsenic, cadmium, chromium, copper, lead, and zinc. Fish populations have declined in the reaches of the river next to mine waste areas. Water from two town wells located near the site could be threatened. Wind-blown particulates from the tailings pile are of concern because of the proximity of a middle school. One wetland area, Maloit Park, located adjacent to the New Tailings Pile, has been affected by surface water and groundwater flowing from the pile and from mass wastage off the pile.

## Cleanup Approach

---

This site is being addressed in three stages: initial and emergency actions and two long-term remedial phases focusing on cleanup of the entire site and the soils.

## Response Action Status

---



**Initial and Emergency Actions:** Between 1976 and 1979, the mine owners undertook early cleanup activities such as treating mine water, revegetating small test plots located in the Rex Flats and old tailings pond areas, and building surface water diversion ditches along the old and new tailings ponds. Workers removed about half the tailings deposited on Rex Flats and built a surface runoff ditch. They also built a seepage collection pond and a sump and liming facility between the old tailings pond and the Eagle River. When the mine was abandoned in approximately 1983 and the pumps were turned off, the mine began to flood. Transformers containing polychlorinated biphenyls (PCBs), located in the mine shaft, posed a threat if flooded. EPA emergency workers removed the transformers from the shaft, secured and stored them on site as usable products, and supplied the electricity needed to run the pump and water treatment systems while the salvage operations were underway. They also constructed dikes in the mine to divert water from the upper mine areas and to prevent its release.



**Entire Site:** In 1988, the State selected a remedy for cleaning up the sources of pollution at the site featuring: plugging the mine portals; removing the roaster piles, Rex Flats tailings, and tailings pile and consolidating them in the "new" tailings pile; capping the new pile and pumping groundwater; and monitoring the Eagle River. The State and a potentially responsible party reached an agreement on performance of a long-term cleanup action. To prevent discharge of contaminated water to the river from the mine, the former owners constructed five concrete bulkheads in mine openings. Under State monitoring, the former mine owners plugged the mine and reworked many millions of cubic yards of mine tailings. They have consolidated approximately 95 percent of the wastes from the roaster piles, Rex Flats, and the old tailings pile into the new tailings pile. In early 1990, however, it became apparent that problems had developed with the ongoing cleanup. Mine seepage, a failed groundwater pump-back system, and run-off from various tailings areas were putting a large quantity of metals into the Eagle River. In 1990, the State and the potentially responsible party agreed to place a water treatment plant on site and to collect and treat visible mine seepage and consolidated pile groundwater.



In the fall of 1992, EPA decided to be more involved in solving problems at the site. EPA evaluated additional clean up measures and issued a Record of Decision in March 1993. These measures included further collection of Eagle Mine seeps, accelerated revegetation, and additional monitoring. EPA also lowered the clean up standards for the Eagle Mine.



**Soils:** In late 1992, an investigation was to begin to explore the nature and extent of contaminated soils at the Eagle Mine site. The study is was completed in late 1993. Soil metals levels were found to be of no concern in Minturn and the Middle School area. Levels are elevated on the Maloit Park wetlands and in Gilman. These problems are being addressed.

## Environmental Progress



The EPA has taken emergency actions at the Eagle Mine site to remove the PCB-laden transformers and to construct dikes to prevent the further spread of contamination. To date, most of the tailings and roaster pile material has been consolidated at the new tailings pile, which is 60 percent capped. A groundwater extraction system is operational, and the mine is plugged and nearly completely flooded. However, water drainage treatment and monitoring river impacts will continue while long-term cleanup actions and additional site investigations are underway in order to protect the Eagle River from contaminated runoff from the site.

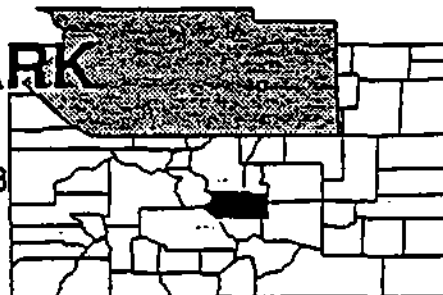
## Site Repository



Town Clerk's Office, Minturn Town Hall, 302 Pine Street, Minturn, CO 81645

# LINCOLN PARK COLORADO

EPA ID# COD042167858



## EPA REGION 8

Fremont County  
Canon City

Other Names:  
Uranium Mill  
Cotter Corporation

### Site Description

Beginning in 1958, the Cotter Corporation operated a uranium mill approximately 1 1/2 miles from the community of Lincoln Park. Mill operations caused the release of radionuclides and heavy metals into the environment. Contaminants migrated through the groundwater to Lincoln Park prior to the construction of a dam on Sand Creek. Drinking water wells in the impacted area have been abandoned and residents have stopped using groundwater for domestic purposes. These homes have been connected to the Canon City water supply; however, some individuals in Lincoln Park are still using groundwater for irrigation purposes. The Lincoln Park area has approximately 3,500 residents.

**Site Responsibility:** This site is being addressed through Federal, State, and potentially responsible parties' actions.

#### NPL LISTING HISTORY

Proposed Date: 09/08/83

Final Date: 09/21/84

### Threats and Contaminants



Groundwater underlying the mill area and the community of Lincoln Park has been shown to be contaminated with uranium, molybdenum, and other radionuclides. Soils in the mill area also are contaminated with similar uranium products. Drinking or otherwise coming into contact with contaminated well water may cause adverse health effects. Wind-blown contaminants and migration of contaminants through surface streams also pose potential threats.

### Cleanup Approach

This site is being addressed in a single long-term remedial phase focusing on cleanup of the entire site.

## Response Action Status

---



**Entire Site:** In 1988, the State selected a remedy to clean up the site by: connecting area residences to an alternate water supply; pumping and treating the groundwater above the dam on Sand Creek to remove the contaminants; flushing the contaminants out of the water below the dam; revegetating the site; implementing air quality controls; and stopping off-site groundwater migration. Area residences have been furnished with safe drinking water. A pilot groundwater treatment system has been installed. Soil, vegetation, and sediment sampling is continuing. To date, the Cotter Corporation has contained the contaminants from the uranium mill using a groundwater cut-off barrier and by pumping the water back into holding ponds. The company is designing the technical specifications for the remedy. Most of the design phase is scheduled to be completed in 1994. A risk study of the site was completed in 1992 to determine the effectiveness of selected cleanup remedies.

**Site Facts:** In 1988, the State and the Cotter Corporation signed a Consent Decree, under which the Cotter Corporation agreed to implement a Remedial Action Plan to clean up the contamination at the site. In addition, in 1988, a Memorandum of Understanding was signed between EPA and the State, giving the State a lead role in overseeing clean-up of the site.

## Environmental Progress



Residences near the Lincoln Park site have been furnished with safe drinking water. A pilot groundwater treatment system has been installed and containment measures have been taken at the site to prevent uranium-contaminated groundwater from migrating off the mill site. Currently, the design for the cleanup remedies that will restore the site to environmentally safe levels is underway.

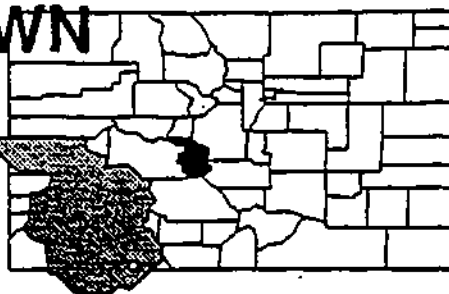
## Site Repository



Canon City Library, 516 Macon Avenue, Canon City, CO 81212  
Colorado State Attorney General's Office  
EPA Superfund Records Center

# SMELTERTOWN COLORADO

EPA ID# COD983769738



EPA REGION 8

Chaffee County  
Near Salida

## Site Description

The Smeltertown site is located in a rural area northwest of Salida, Colorado on the eastern bank of the Arkansas River. The Site encompasses an area of 120 acres and has been impacted by three different industrial activities, smelting, woodtreating, and zinc sulfate manufacturing.

A lead/zinc smelter was operated from the turn of the century until about 1920 on the Site. During this period, hot slag was dumped along the banks of the Arkansas River. The slag still lines the eastern bank of the river. Contaminated soils and slag associated with the smelter operations contain elevated levels of arsenic, cadmium, copper, lead, manganese, and zinc. The smelter smokestack has been placed on the National Register of Historic Places.

Beginning in 1925, wood treatment occurred at this site. Railroad ties and other lumber products were treated with creosote and possible pentachlorophenol. These chemicals were allowed to drip on the ground after the lumber was treated. Creosote contaminated soils were removed from the site in 1986 and 1992.

The CoZinCo facility presently manufactures a zinc sulfate monohydrate by treating galvanizing wastes with sulfuric acid. Localized areas of contamination include several drum piles, sludge disposal and storage areas, and two wastewater lagoons. These sources of contamination are being addressed under a RCRA corrective action Order issued by the State of Colorado.

**Site Responsibility:** This site is being addressed through Federal actions.

**NPL LISTING HISTORY**  
Proposed Date: 02/07/92

## Threats and Contaminants



Confirmed site contaminants include: zinc, lead, aluminum, nickel, chromium, arsenic, creosote, and pentachlorophenol.

## Cleanup Approach

---

This site is being addressed in one long-term remedial phase focusing on cleanup of the entire site.

## Response Action Status

---



**Entire Site:** An investigation was completed in February 1994 to characterize site contaminant sources that might pose an immediate human health threat.

## Environmental Progress



Several short-term actions have taken place on the site. Investigations to identify final cleanup remedies are planned to be completed in 1994. Final cleanup to begin in 1995.

## Site Repository



Town of Salida Public Library

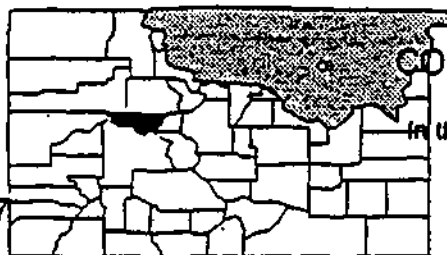
**Initial Actions:** In 1993, several houses were provided bottled water in response to residential wells contaminated with zinc. Soils contaminated with lead and creosote were removed from several residences.

**Smelter:** The EPA is investigating contamination derived from the historic smelter operations. This investigation is scheduled to be completed in August 1994. Clean up is planned to begin in 1995.

**Wood Treating:** Beazer East, Inc., has begun a study to investigate the extent of contamination from the historic wood treating operations. The investigation is scheduled to be completed in 1994. Clean-up is planned to begin in 1995.

# SMUGGLER MOUNTAIN COLORADO

EPA ID# COD980806277



EPA REGION 8  
CONGRESSIONAL DIST. 03  
Pitkin County  
In the northeast corner of the City of  
Aspen

## Site Description

The 116-acre Smuggler Mountain site is an inactive silver and lead mining site that was in operation from 1879 to 1918. Waste rock and mine tailings from mills and mines in the area have been deposited between the Roaring Fork River and the steep slope that forms the western side of Smuggler Mountain. Most of the mines are abandoned, but limited mineral exploration activities are still conducted on-site. Tailings and mine wastes were mixed with native soil, and spread across the site. The total volume of mine waste material has been estimated at 1,300,000 cubic yards. In many cases, development in the Aspen area has taken place directly over waste piles, or mine waste has been dozed into mounds that remain as berms of contaminated soil. Contaminated soil has also been used as fill material in some areas. The site is situated in a residential area in the northeastern portion of the City of Aspen. The City has a year-round population of approximately 4,500, as well as substantial seasonal visitors. The City of Aspen obtains its drinking water from the Roaring Fork River, approximately 1,000 feet downstream from the site.

**Site Responsibility:** The site is being cleaned up through a combination of Federal, State and potentially responsible parties' actions.

**NPL LISTING HISTORY**  
Proposed Date: 10/15/84  
Final Date: 06/01/86

## Threats and Contaminants



Soil is contaminated with heavy metals including lead, cadmium, and arsenic. The potential health threats to area residents include accidentally ingesting contaminated surface soils or eating vegetables grown in contaminated soils. The Roaring Fork River is not contaminated by the site, and thus is not considered a potential health risk to the residents of Aspen.

## Cleanup Approach

---

This site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the residential areas and cleanup of the mine area.

## Response Action Status

---



**Immediate Actions:** In 1985, a party potentially responsible for site contamination installed fencing around portions of the site and posted warning signs, as directed by the EPA. In 1990, EPA excavated, recontoured, and capped contaminated soil on two residential properties as a demonstration project.



**Residential Areas:** The remedy selected by EPA in an ESD issued in 1993 was based on the recommendations of the Technical Advisory Committee, and includes: (1) Capping and revegetation of the highly contaminated berm area. Common-use areas of exposed mine waste, including the Mollie Gibson Park, will also be covered, revegetated and monitored; (2) Implementation of a blood lead surveillance program for young children by the Pitkin County Health Department; (3) Vegetable gardens will be planted in at least 12 inches of clean soil; (4) The Aspen/Pitkin Environmental Health Department will evaluate site construction projects or land use changes to determine whether they present a threat of soil exposure to young children; and (5) EPA will make a final determination regarding remediation of residential soils based on EPA's review of lead speciation studies that have been completed, on-going bioavailability studies, and review of the Pitkin County Health Department's blood lead and dust monitoring program.



**Mine Area:** EPA is currently conducting an environmental engineering/cost evaluation to examine alternatives for addressing contamination in the mine area.

**Site Facts:** In 1985, the EPA issued three Administrative Orders to the potentially responsible parties. The orders required the property owners to notify the EPA of any plans to move soils or mining wastes on the site, investigate site contamination, recommend alternatives for final cleanup, and provide for the fencing and securing of a portion of the site to prevent public access.

## Environmental Progress



Initial actions such as fencing portions of the site and excavating, removing, and capping contaminated soil in other areas have reduced the threat of direct contact with contaminants.

The Region is currently negotiating settlements with the PRPs named in the cost-recovery case. The Region is proceeding to conduct additional technical studies on the bioavailability of the mine wastes to demonstrate the potential risk based on site specific characteristics.

# SUMMITVILLE MINE

## COLORADO

EPA ID# COD983778432



## EPA REGION 8

Rio Grande County  
Del Norte

### Site Description

The Summitville mine site is located in the San Juan Mountains of Colorado. The site, which covers 1,400 acres, is extremely remote at an elevation of over 11,000 feet above sea level and is usually accessible by vehicle only during the summer months. Mining operations began at the site in the late 1800s. In 1986, the most recent operator, Summitville Consolidated Mining Corp. Inc. (SCMCI) began pit mining and gold recovery operations through cyanide heap leaching. SCMCI originally designed the mining operation as a non-discharging wastewater facility. However, problems with discharges eventually compelled SCMCI to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the State to operate a wastewater treatment plant. Throughout operations, several releases of water contaminated with cyanide and metals have occurred. The State has issued Notices of Violation to SCMCI for the unpermitted releases of contaminated water.

**Site Responsibility:** The site is being addressed through Federal and State actions.

**NPL LISTING HISTORY**  
Proposed Date: 05/10/93

### Threats and Contaminants



Several releases of water contaminated with cyanide and metals at the site have been documented. In the past, fish kills have been reported from Wightman Fork to the Terrace Reservoir, approximately 20 miles downstream from the site.

### Cleanup Approach

This site is being addressed in two stages: initial actions and a long-term remedial phase focusing on the cleanup of the entire site.

## Response Action Status

---



**Initial Actions:** The EPA currently is maintaining the site to ensure that 150 million gallons of contaminated water is not released into Wightman Fork, a tributary to the Alamosa River.

Two additional removal actions were initiated in September 1993. The adit system which drains water from the historic underground mine workings is being plugged. This action is expected to flood the mine workings and reduce production of the acidic, metals contaminated water. This action is scheduled for completion in spring 1994.

Working on placing the Cropsy Waste Pile into the mine-pits continued through the winter of 1993. This first phase of moving several of the waste piles on-site was completed on February 11, 1994. Phase II is scheduled to begin during the 1994 construction season and completion of the enter "Cropsy" action is expected to effectively eliminate 70 million gallons of water from entering the Reynolds Adit system. This will further reduce the volume of contaminants generated from the Site.



**Entire Site:** The EPA has to initiated studies to investigate the nature and extent of contamination.

**Site Facts:** The State of Colorado has issued several Notices of Violation to SCMCI. In 1992 SCMCI declared bankruptcy. As a result, the EPA is maintaining the site using Superfund emergency funds.

## Environmental Progress



The EPA is maintaining the site to ensure that no accidental releases of contaminated water occur while investigations to determine the nature and extent of site contamination are being planned.

## Site Repository



*PRIVILEGED AND CONFIDENTIAL*

## **APPENDIX I**

### **QUALIFICATIONS OF CORPORATION AND PREPARERS OF PHASE I ENVIRONMENTAL SITE ASSESSMENT (ESA)**

## **James P. Walsh Chief Executive Officer**

---

M.S., Geology, University of Colorado, Boulder, 1973

B.A., Geology, University of Colorado, Boulder, 1971

C.P.S.S., Certified Professional Soil Scientist

P.G., Professional Geologist

---

### **Experience**

Mr. Walsh has 21 years of professional experience as a multi-disciplinary project manager, environmental geologist, and soil scientist. He is the Chief Executive Officer of Walsh Environmental Scientists and Engineers, Inc., which he founded in 1979. He has served as a consultant to the Office of Technology Assessment - Congress of the United States.

His areas of technical expertise include soil morphology, genesis, classification and mapping, reclamation of disturbed lands, physical and chemical characterization of contaminated soils, hazardous waste site investigations, wind and water erosion, age-dating of geologic and pedologic features, and wetland delineation and reclamation.

Mr. Walsh has participated in many aspects of the environmental regulatory process including project feasibility/environmental fatal flaw studies, project planning and design, safety analysis, project siting studies, the EA/EIS process, public meetings, the RCRA and CERCLA process, and litigation support. In the latter he has been deposed and served as an expert witness, he has experience conducting litigation support research and advising council on technical matters in both civil and criminal cases for both the plaintiff and for the defense.

---

### **Geology/ Soil Science**

Mr. Walsh is presently conducting soil investigations at several major hazardous waste or mining waste sites including the Rocky Mountain Arsenal; the Globe Smelter site; the California Gulch CERCLA site at Leadville, Colorado; the Anaconda/Butte/Silver Bow Creek CERCLA site in Montana; and the Cañon City, Colorado site. Mr. Walsh has many years of field experience in soil mapping in highly contaminated and dangerous areas including experience under Level B (supplied air) situations. He is conducting pilot studies to evaluate the feasibility of restoration of tropical rain forests on drastically disturbed lands and remediation of soil contamination in the Amazon Basin.

---

## **John Murray     Ph.D., Principal Engineer**

---

Ph.D., Geophysical Engineering, Co. School of Mines, 1974  
M.S., Geophysics, Michigan Technological University, 1970  
B.S., Geology, Michigan Technological University, 1968  
C.H.M.M., Certified Hazardous Materials Manager  
R.E.P., Registered Environmental Professional  
R.E.A., Registered Environmental Assessor  
R.G., Registered Geologist

---

### **Experience**

Dr. Murray has 20 years of experience in engineering, regulatory compliance, and earth science investigations. His expertise includes environmental permitting, air quality assessments, environmental site assessments, feasibility studies, and site mitigation/remediation. He has served as project manager at numerous site assessments including petroleum contaminated sites, abandoned landfill assessments, and hazardous waste site investigations. His responsibilities have included project design, site health and safety programs, field site management, and project reporting. His technical experience includes GPR, seismic, electromagnetic, electrical, magnetic, and gravity surveys. He has designed and supervised the drilling of numerous wells throughout the western U.S. and has performed extensive downhole geophysical studies. Dr. Murray conducted drilling and sampling programs on the Rocky Mountain Arsenal to locate and delineate old pesticide and army-agent disposal areas.

As manager of the Environmental Audit/Industrial Hygiene Division, Dr. Murray has managed or conducted over 50 initial site assessments, more than 30 preliminary or detailing site assessments, and several remediation projects at industrial and manufacturing facilities, uncontrolled landfills and vacant lands, some with complex former land usage issues. He has conducted several regulatory compliance audits involving RCRA, CERCLA, CWA, SDWA, and OSHA regulations as well as state and local agency requirements.

### **Environmental Science and Industrial Hygiene**

Dr. Murray was co-founder of the Environmental Science and Technology Program at Front Range Community College and is currently an adjunct professor. He developed the curriculum for OSHA compliance training, environmental laws and policies, and environmental engineering courses. Dr. Murray served as the Corporate Health and Safety Officer for WALSH and developed company procedures for the development and implementation of project health and safety plans.

**Deb Anderson    Audit and Compliance Manager, Environmental  
Scientist**

---

B.S., Microbiology, University of Wyoming, 1979  
Registered Environmental Manager (REM) 1994

---

**Experience**

Ms. Anderson has 14 years of professional experience in environmental science including environmental auditing, permitting, and regulatory compliance. As Audit and Compliance Manager, Ms. Anderson prepares permit applications, conducts compliance audits, and manages site assessments for a variety of clients. Her recent experience includes conducting an extensive site assessment and regulatory compliance review on several thousand acres of land proposed for development, preparing a regulatory compliance audit for a governmental agency's transportation activities, and completing a hazardous waste characterization and disposal project for a former pesticide and fertilizer sales facility.

---

**Regulatory  
Compliance**

Ms. Anderson specializes in environmental site assessments, having participated in over 200 assessments including Phase I and II site assessments, compliance audits, and CERCLA preliminary assessments. She has completed studies on industrial, retail, residential, and commercial facilities.

Ms. Anderson has worked directly with the application of the various environmental regulations including RCRA, CERCLA, CWA, and TSCA. She has managed the NPDES, PCB, UST, and solid waste disposal programs for a coal-fired generating plant, prepared permit applications and compliance reports, established compliance monitoring programs, and prepared regulatory advisories. In addition to Ms. Anderson's regulatory experience, she also has extensive field experience in obtaining surface water, ground-water, soil, and waste samples.

Ms. Anderson is a Registered Environmental Manager (REM 7399), and a certified asbestos inspector in the states of Colorado and Nebraska.

## **David Buscher      Ecological Engineer/Soil Scientist**

---

M.S., Ecological Engineering, Colorado School of Mines, 1992

B.S., Geological Engineering, South Dakota School of Mines and Technology, 1982.

B.S., Wildlife Management and Biology, South Dakota State University, 1978.

---

### **Experience**

Mr. Buscher has 14 years of professional experience, six years as a geologist, three years as a soil scientist with the U.S. Soil Conservation Service (SCS), and five years as a soil scientist/environmental engineer. For Getty Mining Company, Mr. Buscher was assistant head field geologist for a gold exploration project. He also supervised all reclamation activities of drilling pads, access roads, and trenches. He conducted a research project on mercury contamination in gold mining areas in south central Brazil. His research included studying the geochemistry of mercury and mercury compounds in river sediments and water.

---

### **Soil Science**

For WALSH, Mr. Buscher is a senior soil scientist and project manager for soil resource inventories and for jurisdictional wetland delineation projects. Most recently he conducted and managed an intensive Order I soil resource inventory and mapping project in Yarnell, Arizona for a major mining company. He interpreted the reclamation potential of the soils and supplied topsoil recommendations. He is currently working on restoration project of wetlands that were destroyed by peat mining. He was a senior field scientist of an environmental assess at an oil production block in Peru where he identified, delineated, and mapped various levels of hydrocarbon contamination in soils at multiple petroleum facilities. Mr. Buscher conducted a soil investigation for a major ski area in Colorado where he mapped and delineated ecological units based on soil type, landform, and plant community. He also assessed the soil hazards with regard to ski area development.

He assisted in an intensive Order 2 soil survey at the California Gulch CERCLA site in Leadville, CO. He also assisted in an Order 3 soil survey at the Anaconda Smelter CERCLA site in Anaconda, MT in support of a vadose zone investigation. His specific tasks for these soil surveys included soil mapping, defining survey map units, classifying soils, describing and sampling representative soil pedons, describing the nature and extent of mine waste material, and compiling and simplifying existing SCS mapping units.

He was a major author for a smelter RI report and for a pre-mining soil geochemistry report. For the smelter RI report, he identified areas impacted with historic smelter emissions based on soil geochemistry. For the pre-mining soil geochemistry report he developed soil-geologic units; described in detail and sampled by soil horizon multiple soil backhoe pits; and evaluated pre-mining metal concentrations of the soil-geologic units by applying the cumulative probability technique to geochemical soil data.

Mr. Buscher is a Certified Associate Soil Scientist and a Certified Professional Geologist of the State of Wyoming.

## **CORPORATE CREDENTIALS**

Walsh Environmental Scientists and Engineers, Inc. (WALSH) is a full-service, multi-disciplinary environmental consulting firm providing environmental and analytical services nationwide. Founded in 1979 by James P. Walsh, the firm presently employs more than 70 scientists and engineers, including 23 professionals with Master's Degrees and three Ph.D. graduates. With three offices in two states, WALSH has established a reputation for quality and innovation by successfully completing complex environmental projects.

WALSH consists of a diverse group of highly-qualified and experienced professional personnel with advanced expertise in environmental engineering, geology, geochemistry, analytical chemistry, hydrology, soil science, water science, industrial hygiene and safety, and computer technology.

With more than 150 satisfied clients in 21 states, from small business owners to major oil companies, WALSH emphasizes personalized service provided by highly motivated senior professional staff.

### **Environmental Science and Engineering**

WALSH is dedicated to accurately assessing and resolving complex environmental problems in an efficient and cost-effective manner. Our practical approach to managing the application of remediation technologies maximizes the company's ability to accomplish the goals of its clients.

The company's environmental services include:

- Phase I and Phase II ESAs
- "Superfund" and Hazardous Waste Site Investigations
- UST Removal and Remediation
- Soil Boring, Logging, and Sampling
- Installation of Ground-Water Monitoring Systems
- Ground-Water and Surface Water Sampling
- Laboratory Testing of Soil and Ground-Water Samples
- Contaminant Characterization
- Solid Waste Landfill Permitting and Closure
- Computer Modeling of Environmental Systems
- Environmental Impact Assessments/Statements
- Expert Witness and Litigation Support

*PRIVILEGED AND CONFIDENTIAL*

**APPENDIX J**  
**SITE INSPECTION PRIORITIZATION REPORT**

TENTATIVELY IDENTIFIED COMPOUNDS  
METHOD BLANK ANALYSIS

Date Analyzed: 07/06/94  
Laboratory ID: 3MB-187A  
Sample Matrix: Water

Tentative Identification	Retention Time (min)	Concentration	Units
-----------------------------	-------------------------	---------------	-------

No additional compounds found at reportable levels.

Known concentrations calculated assuming a Relative Response Factor = 1.

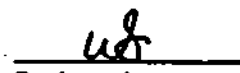
## QUALITY CONTROL:

Surrogate Recovery	%	Water QC Limits
1,2-Dichloroethane-d4	101	76 - 114
Toluene-d8	99	88 - 110
Bromofluorobenzene	99	86 - 115

## References:

Method 8240, Gas Chromatography/Mass Spectrometry for Volatile Organics,  
Test Methods for Evaluating Solid Wastes, SW-846, United States  
Environmental Protection Agency, Third Edition, November 1986.

  
Analyst

  
Reviewed